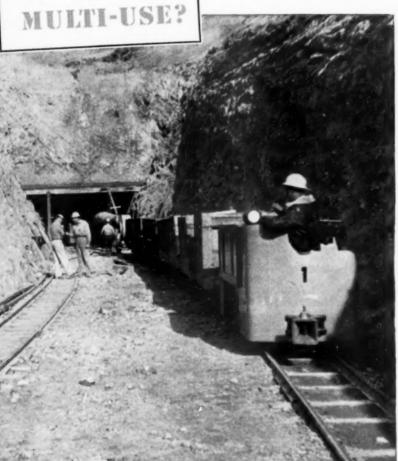
# COMPLEASITY MICHOFILMS EUGENE B.POWER B6 313 N.1ST ST. ANN ARBOR.MICH. CONP-LRY-11-50 CONP-LRY-11-50

Concrete Deck Methods for Ohio Turnpike Bridge . . . Stone Production: Several Articles . . . Flexible Paving Practice Summarized . . . see page 4 for contents

Acceptance Authorized Under Sec. 34.64 P. L. & R.

CARBIDE INSERT?

"Our experience with TIMKEN® carbide insert bits on Big Cliff Dam job sold us on using them for Cajalco Tunnel", says The Shea Company



LOCATION: Cajalco Tunnel near Corona, California.

your best bet for the best bit for <u>every</u> job

TIMKEN

WORKING on a diversion tunnel at the Big Cliff Dam project in Oregon, The Shea Company found that Timken<sup>®</sup> carbide insert bits did the job best. So, when it came time to start the Cajalco Tunnel, W. F. Rennebohn, General Manager, The Shea Company, again chose Timken carbide insert bits.

For hard and abrasive ground, Timken carbide insert bits are the best answer for highest speed. They're also most economical for constant-gage holes, small diameter blast holes and very deep holes.

But they're not the best solution to all your drilling problems.

For ordinary ground, Timken multi-use bits are most economical. With correct and controlled reconditioning, they'll give the lowest cost per foot of hole when full increments of steel can be drilled.

Both Timken carbide insert and multi-use bits are interchangeable in the same thread series. A wide range of different Timken bits fit the same drill steel. As the ground changes, you can change bits quickly, easily—right on the iob.

For the best bit type for your particular drilling requirements, call on the Timken Rock Bit Engineering Service. Write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded



Timken threaded



# **CURB COSTS**

P&H Model 255-A — 3/4-yard shovel capacity.

a faster working

Road jobs do move faster when they're sparked by a P&H. For you're working with a modern machine that bypasses the sluggish aches and pains of holdover designs.

With a P&H you swing smoothly and easily on a huge live roller circle. And you swing on even keel because double adjustable hook rollers cancel out any chance of rocking-horse action.

Furthermore, P&H low-pressure hydraulic control gives you a better feel of the load . . . lets you spot it right where you want it. And don't forget, P&H was the pioneer in all-welded steel construction - the only construction that can take repeated shock loads.

P&H road machines available in capacities up to 21/2 cubic yards. Check with your local P&H Dealer for full facts . . . and a demonstration. See for yourself that there is a difference that saves you dollars with P&H equipment!

PaH

POWER SHOVELS AND TRUCK CRANES

### HARNISCHFEGER CORPORATION

MILWAUKEE 46, WISCONSIN









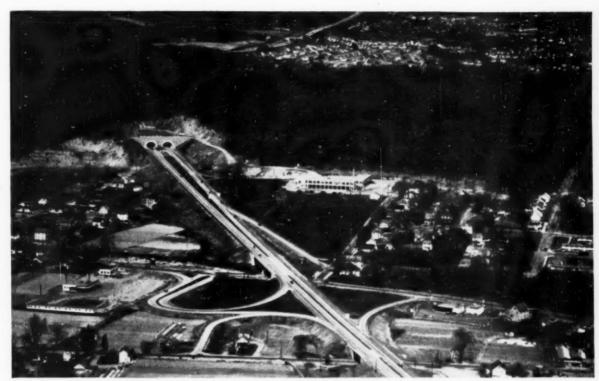












Wilbur Cross Parkway at south end of West Rock's twin-bore tunnel. Highway continues on north side of mountain. Two 24-foot concrete roadways are divided by a grassy median strip. Twelve traffic interchanges permit a free flow of traffic on and off the Parkway. Grade crossings have been eliminated by 19 overpass bridges and 19 underpass bridges.

# Parkway Tunnels Help Motorists Escape



West Rock Tunnels are 1200-ft long, and each tube has two lanes. They are equipped with automatic ventilators, traffic control signals, and an elaborate lighting system that matches at all hours the day or night conditions outside the tunnel.



Before the West Rock Tunnels were completed, motorists had to wind through New Haven. Above, Route 10 on Chapel Street near San Raphael Hospital. During rush periods the Parkway saves an hour's driving time.

## **New Haven Traffic Tangle**

A few years ago, a trip between New York City and New England inevitably included a bout with New Haven's heavy traffic.

Today, thanks to the West Rock Tunnels, drivers can avoid the New Haven bottleneck and enjoy the Wilbur Cross Parkway's full 29 miles. Named for a former governor, the Parkway rolls northeastward from the Housatonic River Bridge at Milford to the Berlin Turnpike at Meriden.

Estimated cost of the Wilbur Cross Parkway was \$17,500,000. Bethlehem furnished steel for the highway, bridges and tunnels.



### BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

### BETHLEHEM STEEL

## **ROADS AND STREETS**

Devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; the construction and maintenance of airports. Represents 62 years of continuous publishing in the highway field; combined with Engineering & Contracting and Good Roads Magazines, established in 1892.

AUGUST, 1954

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BPA

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J. A. Osborne, Manager





SERVICE TRUCKS, right on the firing line, provide on-spot airing and tire inspection

No Tougher Test for men or equipment. No surer place to prove the

rugged endurance, the superior working qualities of Goodyear off-road and earth-mover tires.

And Today's 3-T Cord Tires are by far the most enduring that Goodyear has ever produced! Goodyear's new and exclusive 3-T process keeps Nylon or Rayon cord at its most bruise-resistant, heat-resistant point, controls tire growth, reduces cracking, tread and body failures to new LOWS. Combined with the toughest tread-stocks yet developed, 3-T Cord is one more big reason why you'll find that Goodyear is there—all there—on the toughest jobs you'll ever tackle! Goodyear, Truck Tire Dept., Akron 16, Ohio.

Our Nation's Newest Super-Road—the West Virginia

Turnpike — cuts, fills, bridges, dams and tunnels its way through worse mountain terrain than most contractors have ever tackled. The 88 miles from Charleston to Princeton are 60% solid sandstone and the rest is "largely landslides!" Even Hercules would doff his helmet to the men and machines that are wrapping this one up in less than 15 months!

HARD ROCK RIB

ALL-WEATHER

SURE-GRIP

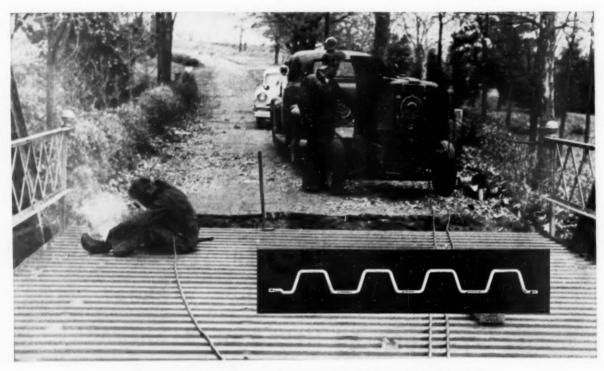
And Remember

NOTHING ELSE TAKES IT LIKE 3-T NYLON FOR EACH UOD, THERE'S A COST-CUTTING GOODYEAR TIRE!

# GOODFYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Sure-Grip, All-Weather-T. M.'s The Goodyess Tire & Rubber Company, Akron, Ohio



Welded to the bridge stringers, Armco Bridge Planks help stiffen the bridge

# 118-foot Bridge Gets New Floor in 5 Days



Asphaltic concrete covers the corrugated planks, providing a smooth traffic surface.

Just 5 days and 59 sections of Armeo Corrugated Metal Bridge Plank were needed to replace the worn floor on this 44-year-old bridge.

After the old floor was removed and repairs made on the substructure, Armco Metal Planks were welded to the bridge stringers. This not only provided a firm floor but actually helped stiffen the entire structure. Asphaltic concrete was applied over the 2-inch deep corrugations to make a smooth, silent traffic surface. The new floor eliminates a costly maintenance problem and assures years of added service at low cost.

You can get Armco Bridge Plank in any length to fit the width of the bridge. Plank width is two feet. Deep corrugations provide ample strength without excess weight. This makes handling easy; helps speed installation. Write us for complete data. Armco Drainage & Metal Products, Inc., 2424 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph. Ontario. Export: The Armco International Corporation.

ARMCO Metal Bridge Plank



# It's doing <u>two</u> money-saving jobs at one time

1 MAINTAINING A HAUL ROAD
2 BUILDING UP FINISHED GRADE



Caterpillar Motor Graders not only do a variety of profitable jobs, but often do two of them at once. An example is the No. 12 pictured. It's at work on a job near Washington, D. C., for Williams Construction Co. of Baltimore.

"Our Caterpillar Motor Graders," explains Eugene H. Owens, superintendent, "maintain good haul roads for our rubber-tired CAT\* earthmovers and grade and slope bank at the same time. Finished grade is completed as we make the fills and cuts. That way money is saved as well as time."

These big yellow work horses are among the most economical machines in the construction business. Think of the equipment it would take to replace one Caterpillar Motor Grader. These machines can grade and maintain roads, cut banks, bulldoze, ditch and cast, spread, widen roads and even plow snow.

But more important, they do all these jobs for years and years. These hard-working brutes are all Caterpillar-built. That means built for long life. Some of them built in 1934 are still in operation. Ninety-

nine per cent of all'Caterpillar Diesel Motor Graders ever built are still hard at work! That's money in the bank.

Why not see how one of the three sizes of Caterpillar Motor Graders can build profits on your current job? It only takes a call to your Caterpillar Dealer. He'll be happy to demonstrate it. Just name the date.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.

## CATER PILLAR\*

USE CAT EQUIPMENT

FOR MONEY-MAKING PERFORMANCE

# How to get BIGGER output on BIG trench hoe jobs



K-370 DEEP-DIGGING TRENCH HOE DELIVERS MORE YARDS PER SHIFT. Sewer jobs like this are completed faster because dig-swing-dump cycles are much smoother. Operator has perfect "feel" of load as he operates conveniently located short throw Speed-o-Matic levers. Gooseneck hoe boom gives superior digging-dumping action.

LINK-BELT SPEEDER CORPORATION, Coder Repids, lowe

K-300 series machines offer extra capacity and power PLUS *Speed-o-Matic* control

FIELD reports show that outfits using K-300 rigs have a decided advantage in bidding and getting the BIG jobs—at a profit! Greater output does it!

Extra work capacity of K-300 rigs is a combination of many things. Speed-o-Matic power hydraulic control keeps operator far fresher, more alert all day. Means greater output—up to 25% more buckets delivered.

K-300's greater power (142 usable hp) speeds digging because it minimizes stalling, produces smoother swings. Add to this the stamina and more "live weight" that permit continuous operation under full power month after month. No wonder owners say the K-300 is the best producer money can buy! See your distributor or write for K-300 series literature now.



Speed-o-Matic is today's fastest, easiest-to-operate and most troublefree control system. Now standard on all Link-Belt Speeders.



Note the size, weight and heft built into the working parts and structure. More "live" weight permits more efficient use of extra horsepower.

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND WHEEL-MOUNTED SHOVEL-CRANES

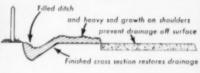
LINKBELT SPEEDER

# Let These ADAMS Machines

# RENEW YOUR ROADS THIS LOW-COST WAY









Do you have surfaced roads which have lost their drainage—ditches need cleaning—sod has built up on shoulders so that water can't drain off the road surface? Such roads become soggy—require excessive maintenance.

A motor grader, an Adams TraveLoader and a few trucks can rebuild those grades good as new at the rate of about a mile a day at low cost. Such a reclamation job on a gravel road is pictured here. The motor grader cleans ditches and cuts down shoulders and the TraveLoader quickly loads surplus material to be hauled away. Many counties sell the material to nearby farmers for \$1 a load, thereby cutting costs.

Money spent in this way not only salvages the road grades and vastly reduces maintenance costs, but makes a good showing for the taxpayer's money.

Talk to your Adams dealer now about an Adams Trave-Loader and a restoration program on your roads.

J. D. ADAMS MANUFACTURING · INDIANAPOLIS, INDIANA



The TraveLoader is also great for loading all kinds of loose material out of stockpiles









### Johnson 50 to 125-yd. Roadbuilders plants

Flexible All-Welded Roadbuilders Bin gives you a portable batch plant for 2, 3 or 4 aggregates, or converts to transit-mix (shown) or centralmix plant for bulk cement and 2 or 3 aggregates. Can be equipped with 1 or 2 multiple material Hi-Speed Batchers, size 34 Roadbuilders Batcher, or truck-mixer charging batcher in 2, 3 or 4-yd. sizes. Bin available with 2, 3 or 4 compartments, 50 to 125 cu. yds. Also: silos, elevators, buckets.

C. S. JOHNSON • Champaign, III. (Keehring Subsidiary)

# 7-second discharge with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S Dandie® also has side or end discharge, 2 or 4 wheels, and special tower attachment. Other sizes: 3½-S to 16-S. Also check Kwik-Mix bituminous, tilt and non-tilt plastermortar mixers . . . and Moto-Bug® (power wheelbarrow) shown here. Ask your Kwik-Mix distributor for all facts.

KWIK-MIX • Milwaukee, Wis. (Keehring Subsidiary)

# 17½ feet per minute with 202 Trenchliner®

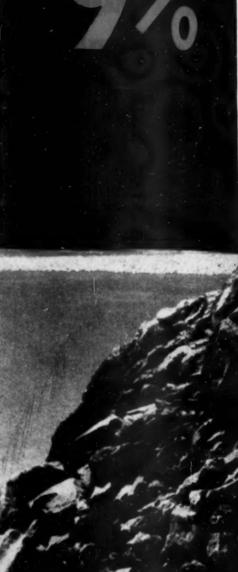
On utility, drainage and irrigation trenching, you can dig up to 17½ ft. per min., 13 to 31 in. wide, in depths to 6 ft. with this 202 wheel-type Trenchliner. It has: square or round-bottom buckets; quick-change bucket fronts with cutting lips or "Tap-In" teeth; 16 or 20-in. crawler shoes; gas or diesel engine. Tile box and chute optional. Also check 215 wheel-type; 3 big ladder-types, full crawler mounted; utility Trenchliner on rubber.

PARSONS \* Newton, Iowa (Koehring Subsidiary)

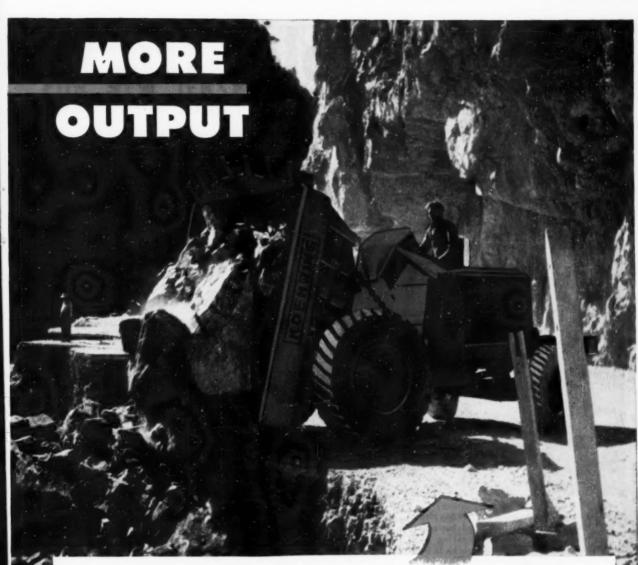








ORAVITY DUMP never balks . . . never years out. You get the same one-second dumping every time . . . under heaviest loads, and in all temperature extremes. There are no holst maintenance delays, no costly holst replacement parts to eat into profits when you use gravity-dump Dumptors.



## ... with ONE-SECOND gravity dump

In just one second, Koehring heavyduty Dumptor dumps its 6-yard load. Operator trips the body-release lever, and gravity tilts the scoop-shaped body 70°. One second later the load is out, and Dumptor is on its way back for the next load.

Because there's no waiting for slow-acting body hoists, Dumptor saves 15 to 25 seconds on every dump. This earns an important increase in extra yardage output. For example, take a typical 1,000-foot haul where an ordinary dump truck is making 16 trips an hour. Even if Dumptor took the same time to load, haul and return, it would average 17½ trips per hour on the same cycle. That's because Dumptor's one-second dumping advantage saves an average of 20 seconds on each trip . . . gains a total of 5.3 minutes more productive haul-time per hour. This, alone, adds 9% more yardage to your average hourly production.

What's more... by eliminating only 2 turns each trip, Dumptor no-turn shuttle-hauling adds another 10% increase in yards per hour. You'll find Dumptor® well worth looking into. See your Koehring distributor soon.

CK118

KOEHRING COMPANY



(Subsidiaries EWIX-MIX - PARSONS - JOHNSON)

# **New Chevrolet Trucks**

deliver more power, more ruggedness, for less money!



Making sure the truck you buy has plenty of power and chassis ruggedness is good business in any man's book. Getting the money-saving extra power and ruggedness of Chevrolet trucks is better business in any man's bookkeeping.

#### EXTRA POWER MEANS BIGGER SAVINGS

No doubt about it, the extra power you get from new high-compression Chevrolet truck engines means you're going to pay out less for gasoline. Over a year, that adds up to a sizeable savings. Increased power brings time-saving benefits, too—greater acceleration and hill-climbing ability . . . you haul faster, get the job done quicker!

### GREATER RUGGEDNESS CUTS OPERATING COSTS

Heavier axle shafts and wheel hubs on two-ton models; bigger, more durable clutches on light- and heavy-duty models; stronger, more rigid frames on all models. These features pay off in extra-low upkeep costs . . . extra miles of dependable truck life.

But these wbile-you-drive savings aren't all, by a long shot. You even save wben you buy. For Chevrolet is America's lowest-priced line of trucks. Stop by your Chevrolet dealer's soon to see the "savingest" trucks on the road. He'll show you models ideally suited to your job, with facts to prove you'll get more for your money. Chevrolet Division of General Motors, Detroit 2, Mich.



MOST TRUSTWORTHY TRUCKS ON ANY JOB!

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES THREE GREAT ENGINES—The new "Jobinaster 261" engine\* for extra heavy hauling. The "Thriftmaster 235" or "Loadmaster 235" for light-, medium- and heavy-duty hauling. NEW TRUCK HYDRA-MATIC TRANSMISSION\*—offered on ½-, ¾- and 1-ton models. Heavy-Duty SYNCHRO-MESH TRANSMISSION—for fast, smooth shifting. DIAPHRAGM SPRING CLUTCH—improved-action engagement. HYPOID REAR AXLE—for longer life on all models. TORQUE-ACTION BRAKES—on all wheels on light- and medium-duty models. TWIN-ACTION REAR WHEEL BRAKES—on heavy-duty models.

DUAL-SHOE PARKING BRAKE—greater holding ability on heavy-duty models. NEW RIDE CONTROL SEAT\*—eliminates back-rubbing. NEW, LARGER UNIT-DESIGNED PICKUP AND PLATFORM STAKE BODIES—give increased load space. COMFORTMASTER CAB—offers greater comfort, convenience and safety. PANORAMIC WINDSHIELD—for increased driver vision. WIDE-BASE WHEELS—for increased tire mileage. BALL-GEAR STEERING—easier, safer handling. ADVANCE-DESIGN STYLING—rugged, handsome appearance.

Optional at extra cost. Ride Control Seat is available on all cabs of 1½- and 2-ton models, standard cabs only in other models. "Johnaster 261" engine available on 2-ton models, truck Hydra-Matic transmission on ½-, ¾- and 1-ton models.

# NOW! 8 PRESTRESSED CONCRETE BRIDGES FOR NEW JERSEY'S GARDEN STATE PARKWAY



Being lifted into place is one of the prestressed concrete girders produced by The Formigli Corporation. Overpass spans vary from 40 to 60 feet.

CROSS SECTION OF BRIDGE

BO ALC TOC MAGE

ELEVATION OF PRESTRESSED GIADER

PRECAST GIRDER SECTION



General view of the Formigli 320-foot prestressed concrete casting bed. At right are inverted "T" girders awaiting delivery.

THE FORMIGLI CORPORATION, Berlin, N. J. recently cast prestressed concrete beams for eight overpasses\* on Section 11 of the Garden State Parkway near Atlantic City. Production in the 320-foot casting bed was 160 linear feet of prestressed members per day—the pouring being done on one day and the steam curing on the next. The tensioning elements were Roebling 3%-inch diameter, 7-wire stress-relieved Prestressed Concrete Strands and the maximum initial prestressing force was 240 tons.

For years, The Formigli Corporation has produced precast concrete members. To broaden its market, the pretensioning bed and post-tensioning system were added recently, and the Garden State Parkway job was its first in the pretensioned field. Prospective business includes prestressed building girders, floor and roof deck members, and spans beyond the reach of the Corporation's well-established line of precast reinforced members.

Roebling engineers, who have pioneered in the development of prestressing techniques and tensioning elements in America, are always ready to offer suggestions to help assure best results on any specific prestressed concrete applications. Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

\*Designed by Gannett Fleming Corddry & Carpenter, Inc., Harrisburg, Pa.; General Contractors, A. J. Groves & Sons Co., Minneapolis, Minn.



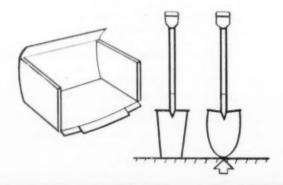
Subsidiary of The Colorado Fuel and Iron Corporation

# MR. CONTRACTOR: Compare these dirt-



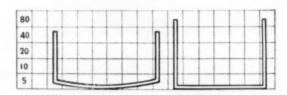
#### PENETRATES FASTER

Curved and offset cutting edge on Allis-Chalmers Motor Scrapers concentrates all the horsepower on the center section during initial penetration. The penetrating ability of a round-end spade helps illustrate the practical soundness of this Allis-Chalmers design.



#### LOADS FASTER

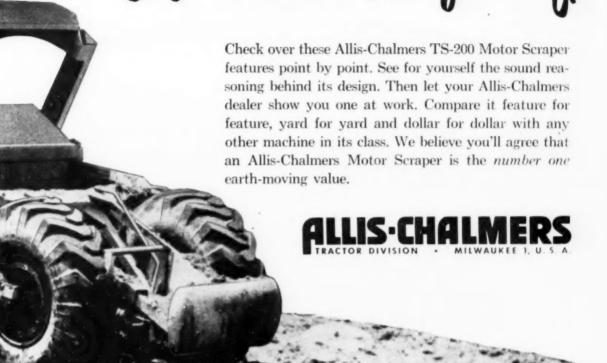
Low, wide bowl plays an extremely important part in ease of loading. Tests have proved that loading resistance is largely determined by the height to which the load is built. New dirt entering the bowl must lift the load directly above it in order to make room for itself.



This chart shows how loading resistance continually increases as the load builds up . . . how the lower, wider bowl of an Allis-Chalmers Motor Scraper requires less time and power to get the same yardage.

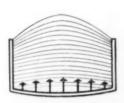
PERFORMANCE MAKES DOLLARS

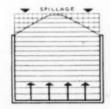
# moving features before you buy



#### HEAPS AUTOMATICALLY

The combination of slightly deeper center cut and correctly angled cutting edge shapes the load as the scraper fills. The greater volume of dirt flowing into the center of the bowl "boils" forward, to the rear and to the sides, producing an automatically heaped load without excessive spillage.

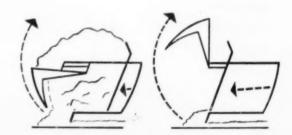




These diagrams show how an automatically heaped load avoids costly spillage even though the center is built up above the sides of the bowl.

#### SPREADS EVENLY

Forward movement of ejector is timed with lifting action of apron, which provides a continuous flow of material to insure a smooth, even spread.



High apron lift prevents any possibility of material's jamming. Even when loaded from overhead, anything that can be put into the bowl can be easily ejected.

WHEN DESIGN MAKES SENSE

Modern as the jet age!



New as tomorrow!



# Yours only with DODGE TRUCKS! Advanced POWER-DOME V-8's!

You get efficient power! Unique dome-shaped combustion chamber makes new Dodge truck Power-Dome V-8's the most efficient of all V-8's! Thrifty time-tested 6's, too!





You enjoy greater calc comfort!
More hiproom (6134"), more shoulder-room (58 %") than any other leading make! Plus 2261 sq. in. of vision area—most of any trucks!

You travel in high style! You get the sleekest, lowest built lines of any truck . . . smart new colors inside and out! And these are the easiest handling trucks of all!



# DODGE Job Rated TRUCKS





Military Road Bridge, Marine Corps Recruit Depot, Parris Island, S. C

Espy Paving and Construction Co., contractors, Savannah,

Inset: Metal pre-forms, note slots to accommodate H-beam.

### DENFORM

reusable capital form designed for use with

SONOTUBES.

Write for details

# FIBRE FORMS

### for round columns of concrete

At Parris Island, S. C. the steel H-beam piers for the structure illustrated were encased in round concrete columns formed with SONOTUBES.

With 24" I.D. SONOTUBE Fibre Forms inside metal preforms, the metal was removed soon after the concrete was poured, and used again on other piers thus saving job-time and money.

The low cost SONOTUBES, lengths varying from 6' to 14', were not stripped but remained in place allowing the concrete to cure for the specified 28 days.

Whatever the structure, for a fast, economical method of forming round columns of concrete, use SONOTUBE Fibre Forms and save time, money and labor! Approved by contractors, engineers and architects everywhere.

In 31 sizes, from 1" to 36" I.D. up to 50' long. Can be ordered in specified lengths or sawed to your requirements on the job.

For complete technical data and prices, write



SONOCO PRODUCTS COMPANY

HARTSVILLE S C - MAIN PLANT

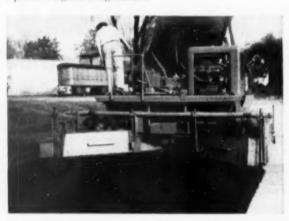
See our catalog in Sweet's

# Up goes tonnage...down go costs

Jaeger Paver-Type Aggregate Spreader accurately places materials as fast as trucks can deliver



Only 45 seconds to place 8-ton loads of coarse stone on Pennsylvania project. 1300 tons per 10 hrs. included 4½ hrs. waiting time on Massachusetts circumferential highway. In one pass, spreader evenly lays up to 10" depth of coarse aggregates, without hand labor. Accurate spreading is insured by carrying strike-off on floating straightedge runners, which equalize subgrade irregularities.



Top course for secondary roads, parking lots. Accurately lays both base and surface aggregates and any free-flowing hot or cold bituminous mixture. Its low cost and simplicity also makes the Jaeger spreader highly practical for use by smaller contractors on parking areas or drives (costs half the price of bituminous pavers). Blends perfect joints, can lay flush to curbs, headers.



Accurately spreads 210 cu. yds. per hr. of dry macadam for West Coast jet bomber runway base. Places up to 12" thickness of fine or graded materials to 11' width, or equal volume in lesser thickness to 12'6" width. Width changes are made by easy telescopic adjustment. Traction is always on subgrade, to avoid displacing newly-laid material. Has ample capacity to push loaded material trucks.



18" of stiff mix placed true to grade, in three 6" courses, 3000 to 3800 tons per day of sticky crushed limestone and calcium chloride mixture placed by tandem Jaegers on Tennessee super-highway—with unused capacity of 1000 tons per machine due to waiting time. In North Carolina, two spreaders placed over 2000 tons per day of plant-mix so sticky pneumatic-tired rollers had to be used. Two spreaders can lay to 25' width.

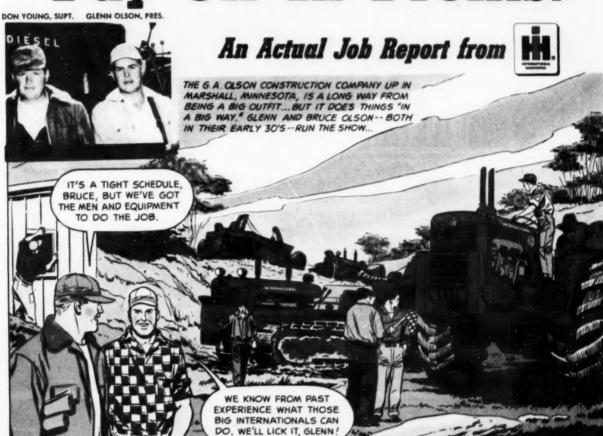
Two sizes, to fit your trucks. For complete information, see your Jaeger distributor or write for Catalog SPS-4.

### THE JAEGER MACHINE COMPANY

223 Dublin Avenue - Columbus 16, Ohio

LOADERS . PUMPS . AIR COMPRESSORS . TRUCK MIXERS . CONCRETE MIXERS

# Big Rigs Pay Off In Profits!

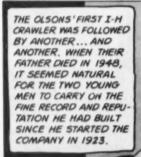




THE CONSTRUCTION CAREERS OF THE TWO BOYS WERE INTERRUPTED BY THEIR SERVICE IN WORLD WAR II. BUT, WHEN PEACE CAME...









EVEN THOUGH WE ARE
A MEDIUM-SIZE OUTFIT, THE
BIGGEST, FASTEST EQUIPMENT
WE CAN GET WILL CUT OUR
UNIT DIRT-MOVING COSTS.

IT'S THE ONLY WAY WE CAN
MEET COMPETITION, GLENN.
WE'VE GOT TO HAVE A
RUBBER-TIRED MACHINE TO
HANDLE DUR LONG HAULS
... ONE THAT WILL KEEP
MOVING DIRT WITHOUT DOWNTIME.



COPYRIGHT 1954, PICTORIAL MEDIA, INC.

ON JOB AFTER JOB,
THEIR DECISION PAID
OFF. THE BIG, FAST
RUBBER-TIRED RIGS
WITH AN ALL-INTERNATIONAL TEAM OF
CRAWLERS AND
SCRAPERS--PERMITTED
LOW BIDDING AND
REALLY PROFITABLE
PERFORMANCE...
WERE USED ON
MORE THAN 90% OF
THE G.A. OLSON
COMPANY JOBS...



AND THEN, IN 1952, CAME ONE OF THE TOUGHEST TESTS... IZ MILES OF REBUILDING ON HIGHWAY 59 IN MINNESOTA. THEY BID \$173,000 FOR 386,000 CUBIC YARDS IN WET, SWAMPY LAND... AND THE BID WAS LOW. THEY HAD ONLY A 90-DAY TIME LIMIT!

IF WE JUST GET A DECENT BREAK IN THE WEATHER, THIS'LL BE A GOOD PROFITABLE JOB. TO BE A
MEAN ONE
IF WE DON'T!





AS RAIN FELL FASTER THAN THE EARTH COULD SWALLOW IT ... 14 INCHES IN 10 DAYS ... WATER LAY INCHES DEEP ON THE HIGHWAY RIGHT-OF- WAY. ALTHOUGH THE OLSON OUTFIT WAS PINNED DOWN FOR DAYS AT A STRETCH, THEIR EXPERT OPERATORS AND TEAM OF BIG INTERNATIONALS KEPT LOADS OF SOGGY. WATER-LOGGED MATERIAL MOVING ON DAYS WHERE IT LOOKED IMFOSSIBLE ...





YES, WE'RE MOVING MORE
DIRT NOW WITH LESS EQUIPMENT... AND AT A LOWER
COST PER YARD-- THANKS
TO INTERNATIONAL!

WELL, THANKS,
MR. OLSON,
IT'S A GREAT
STORY... AND
WE'LL TELL IT
JUST AS IT
HAPPENED.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



# INTERNATIONAL

MAKES EVERY LOAD A PAYLOAD

# Now All in One Family

the hardest-working work teams in the world!



TD-24 crawler with matched scrapers



TD-18A crawler with matched scrapers



TD-24 crawler with bullgrader



TD-14A crawler with cable bullgrader



TD-9 crawler with hydraulic bulldozer



TD-9 tractor with front-end loader



TD-6 crawler with hydraulic bulldazer





Model 2T-75 two-wheel, rubber-tired tractor with 18-yard heaped capacity scraper



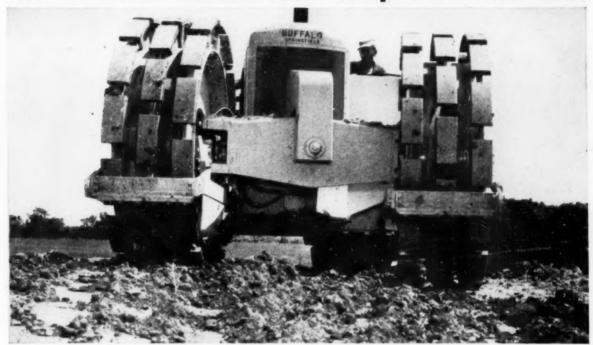
Model 2T-75 two-wheel, rubber-tired tractor with 20-yard heaped capacity bottom dump wagon



Model 2T-55 two-wheel, rubber-tired tractor with 13-yard heaped capacity scraper

CR-611-D. 6-20. LITHOGRAPHED IN UNITED STATES OF AMERICA

## You've never before seen Compaction like this!



## Announcing the new and revolutionary

# **Buffalo-Springfield Kompactor**

What do we mean by "new"? There's never been anything like it before!

Why do we say "revolutionary"? Because the Kompactor is changing *drastically* the time and cost elements in soil compaction jobs!

Here are the spectacular results of tests in the field:

The Kompactor has met density requirements in one fourth the number of passes required with large sheepsfoot, vibrating, or heavy pneumatic-tired rollers. One contractor reports a cost savings of 50% on an embankment job!

The Kompactor is self-propelled, reversible, and easy to maneuver on steep embankments, can work in close to abutments, culverts, etc.



The unique rolls of the Kompactor are segmented. The staggered "islands" that form the rolling surface enter loose material with minimum displacement, either forward or horizontally. They leave without disturbing compacted areas in any way. All compaction effort is downward, resulting in greater and more uniform density from lower elevations to top surface. As a result, two passes with the Kompactor will often meet density requirements!

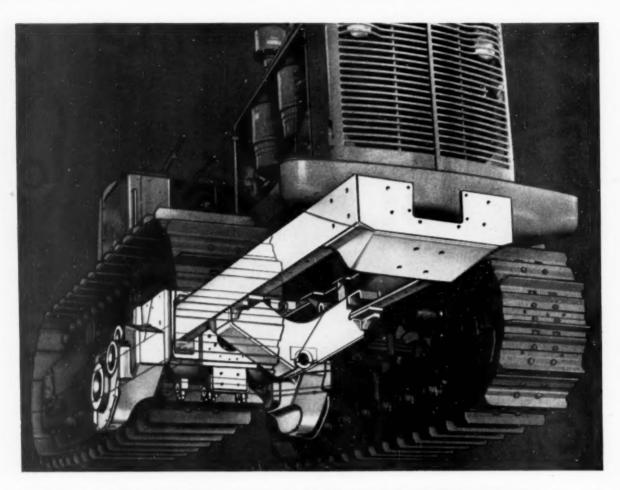
Before you bid another soil compaction job, find out more about the Buffalo-Springfield Kompactor. It may completely change your time and cost picture, give you a clear-cut advantage in bidding those close jobs!

Write today for full information.

The Buffalo-Springfield Roller Co. Springfield, Ohio



THE LEADER IN ROAD ROLLER DESIGN AND MANUFACTURE.



# HOW THE MAIN FRAME CONTRIBUTES TO TOP TRACTOR PERFORMANCE

One of the big reasons why more and more Allis-Chalmers tractors are being used today is their exclusive main frame design.

These frames are one-piece, all-steel welded structural members (like the girders in a bridge or the columns in a building). They help provide greater strength and flexibility to withstand shock loads . . . make possible better equipment mounting, improved weight distribution and outstanding service simplicity as well.

We invite you to see these advantages . . . first at your nearby Allis-Chalmers dealer . . . and then in a demonstration.

"ROLLS WITH THE PUNCH" — All-steel main frame flexes slightly under extreme shock loads . . . without transmitting strain to engine, clutch or transmission.

BETTER EQUIPMENT MOUNTING — This frame's compactness provides ample clearance for equipment like front-end shovels . . . permits wide track shoes . . . improves performance of entire unit.

IMPROVED WEIGHT DISTRIBUTION — Box A-frame allows location of main components for best over-all balance . . . putting more weight lower in tractor where it does the most good.

SERVICE SIMPLICITY — Since main frame carries structural load, power drive components can be readily removed, repaired or replaced without disturbing adjacent parts.

ALLIS-CHALMERS

For smooth-riding turnpikes and thruways that last

specify the fabric with the red and white tag



SUPERHIGHWAY OR CITY STREET, concrete roads need the extra strength and crack resistance provided by American Welded Wire Fabric reinforcement.



**AMERICAN** 

EASY HANDLING helps cut construction costs. American Welded Wire Fabric comes in prefabricated sheets that lay flat and stay in place while concrete is poured.



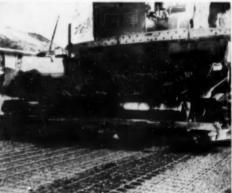
MODERN ROADS that are reinforced with American Welded Wire Fabric are extremely comfortable and safe because the concrete stays smooth and even.

MANY APPLICATIONS of reinforced asphaltic concrete, some in service on test roads for many years, indicate that you should reinforce your next asphaltic concrete resurfacing job with American Welded Wire Fabric.

THE extra-special care we take in manufacturing American Welded Wire Fabric, a prefabricated steel product, assures you of reinforcement that always meets, and surpasses, the new ASTM Specification A185-53T. Many famous turnpikes and principal thruways are reinforced with this high quality product.

As well as providing long-term protection for the bond holder, American Welded Wire Fabric provides low road maintenance and guarantees high salvage value at the time turnpikes are paid for and turned over to the state. American Welded Wire Fabric reinforced concrete turnpikes insure good visibility for safe travelling and smooth riding because of longer slabs.

Always look for the red and white tag on fabric delivered to your jobs. Ask specifically for American Welded Wire Fabric.



AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS

TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS . UNITED STATES STEEL EXPORT COMPANY, NEW YORK

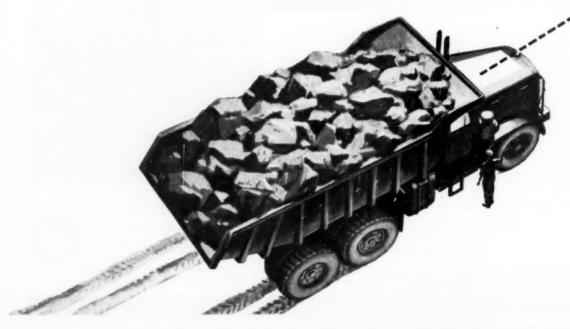
EVERY TYPE OF REINFORCED CONCRETE CONSTRUCTION NEEDS

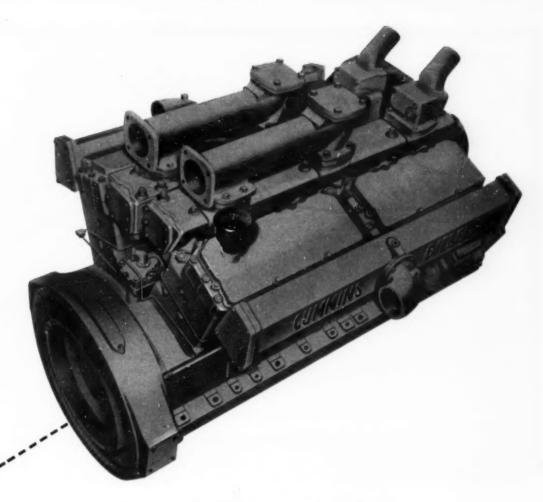


UNITED STATES STEEL

# The Cummins answer to the trend toward bigger and faster equipment

A powerful, lightweight diesel that





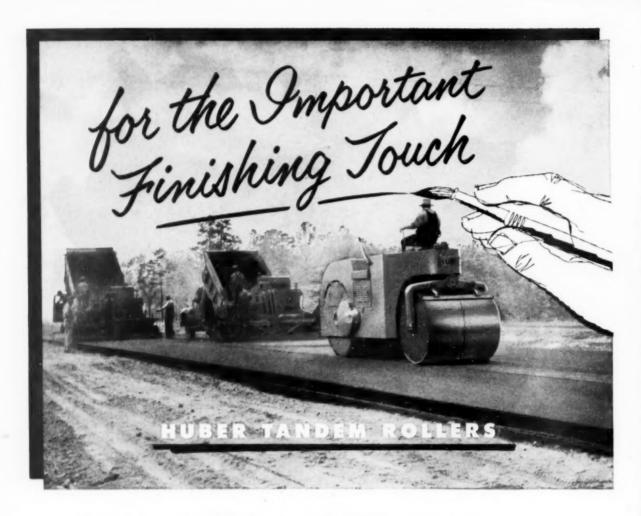
### moves more payload per shift

Cummins modern 12 cylinder V-type diesels anticipate needs of the future. They include the 400 h.p. NVH-1200, the 550 h.p. NVHS-1200, and the 600 h.p. turbocharged VT-12. Powering trucks, shovels, locomotives, and other heavy-duty equipment, these rugged units get more done per shift by handling bigger loads faster, at less cost. You can get specifications by calling your Cummins dealer or equipment representative.



# CUMMINS Cummins Engine Company, Inc. • Columbus, Indiana

Leader in rugged, lightweight, high-speed diesels (60-600 h.p.)



### Why do without these Advantages?

Here's capacity to keep two finishing machines busy... Here's size to handle mile after mile of pavements on schedule... Here's freedom from scuffing, for Huber's guide roll assembly can be kept "factory new" for the life of the machine... Here's the fast, smooth, cushioned reversing of fluid coupling... Here are adjustable tapered roller bearings that add years of snug operation through adjustments that compensate for wear... Here is swivel pin and king pin design and construction that ends guide roll problems forever... Here is a heavy, rigid, wrap-around frame permitting close side clearance... HERE, in short, is EVERYTHING you've ever wanted in a tandem roller. Your nearest Huber Distributor will be happy to show you Bulletin T-152 and give you the rest of the story.

### ABOVE

This big HUBER keeps two finishing machines hustling on an expressway in the South. Other HUBER Tandems are busy on blacktop jobs throughout the world.

MUBER MANUFACTURING CO. - Marion, Ohio, U. S. A. Massfacturers of Haber Maistainers, Graders and Complete Line of Rollers



want high speed plus endurance? How's this...

1000 HOURS

at 3600 R.P.M.

UNDER FULL

LOAD!

If you were to drive 90,000 miles up an incline at 90 m.p.h., you would approximate the performance of the Model 24A, 331 cubic inch displacement Chrysler Industrial Engine pictured below.

To prove the power of Chrysler Industrial V8 Engines . . . their ability to run for long periods of time at high speed . . . on March 17, 1954 Chrysler engineers placed a production model Ind. 24A Engine on an endurance dynamometer at Chrysler Central Engineering Laboratories. Objective: 1000 hours operation at 3600 R.P.M. under full load.

During every one of the 1000 hours, the Chrysler Ind. 24A Engine delivered an average of 174 horsepower and when shut down, the engine was still in perfect operating condition.

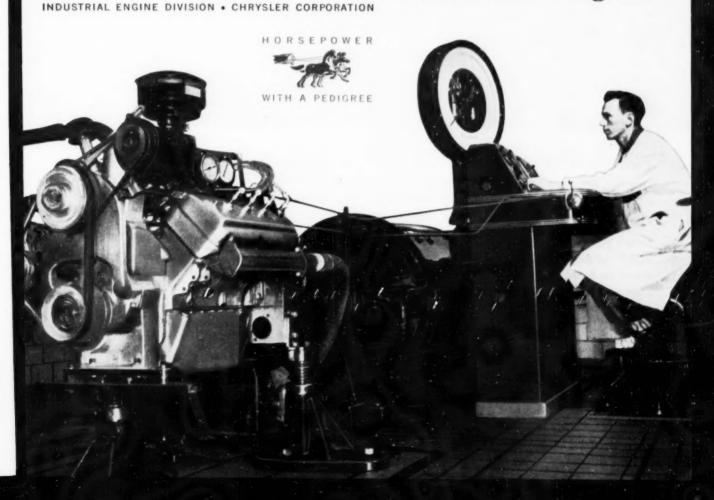
During the run no service was necessary beyond minor maintenance care, such as oil changes and very infrequent spark plug changes and point adjustment. Yet, following disassembly of the engine, the only wear noted was negligible—no more than you might expect from an engine that has been operated for 1000 hours within a long period of time.

While there is every reason to believe that this is a record-breaking endurance run (and don't forget it was made at 3600 R.P.M. under full load), we are confident that every Chrysler Industrial V8 Engine will at least equal this astounding record.

This proves too, beyond a doubt, that the Chrysler Industrial V8 hemispherical combustion chamber design with its short-stroke, low-friction construction, makes an ideal power plant for any equipment that requires continuous high speed operation. Furthermore, in installing a Chrysler V8 Engine in preference to a diesel engine of similar horsepower, you can reduce your size estimate by one-half, your weight by two-thirds, and your cost factor by three-quarters!

For detailed information on the Model 24A or any Chrysler Industrial Engine, see a Chrysler Industrial Engine Dealer, or write: Dept. 118 Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

# C H R Y S L E R Industrial Engines



# EXTRA PAYLOADS pay off in EXTRA PROFITS



TWO SCRAPERS may have the same rated capacity, the same top speed and even the same rated horsepower... why is one just a marginal producer and the other a real money maker?

Before you buy any equipment, check with owners about maintenance costs, yardage production, downtime for repairs, and actual job performance and you'll have the answer. Contractor preference for "Euc" Scrapers—fastest growing scraper line

in the industry—is based on exceptionally high job availability and productive capacity. Less downtime means more yards per day and lower costs per yard.

It's the week by week performance—not "hot rod" demonstration figures—that has made "Eucs" an important part of the profit picture for so many leading contractors, large and small. Have your Euclid Distributor give you the facts soon.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



Euclid

d Equipment

GENERAL MOTORS

FOR MOVING EARTH, ROCK, COAL AND ORE



### ANOTHER MISSOURI BASIN DAM BUILT WITH "BUCS"

Excavation for Tiber Dam in Montana will exceed 15 million cu. yds. which must be moved in three working seasons. James-Wunderlich Construction Co. is using a fleet of 25 "Eucs", eight 15.5 cu. yd. scrapers and seventeen 25 cu. yd. bottom-dumps to haul from three borrow pits as far as 2.8 miles from the dam. Five of the scrapers are top loaded by a 5 yd. dragline that excavates impervious fill material from the outlet channel. Average hourly production of each scraper on a 2200 ft. haul is 90 bank yds. of material weighing 3200 lbs. per bank yd. Excellent job availability and minimum downtime of the "Euc" Scrapers is paying off in extra production and lower costs.

The Bottom-Dump fleet is now on its third major dam project since 1947, having worked on Cherry Creek Dam in Colorado prior to moving 6 million yds. at Oahe Dam in South Dakota... further proof of Euclid stamina and dependability.

### VERSATILITY IS THE WORD. FOR THE LUCID TWIN-POWER SCRAPPR

It's four-wheel drive, no-spin differential, and total of 380 or 400 h.p. with Torqmatic converter and transmission provides ample power and traction for self-loading and high speed hauling of heaped loads up to 24 cu. yds. Contractor Bert Altfillich first used his two "Twins" for canal and levee construction on a flood control project at Long Beach, California. He then put them to work on land leveling for a large residential subdivision and is now completing a plant site grading job involving 250,000 cu. yds. of sand.

Owners in other sections of the country, too, are enthusiastic about this Euclid Scraper because of its efficiency and low cost dirt moving performance on road work, dams, airports, stripping and stockpiling operations...one of every three is a repeat order.

### EUCST KEEP NOWTH CAROLINA JOB WELL AHEAD OF SCHERING

Hertford & Cecil are using 7 Euclid Scrapers, five 15.5 cu. yd. and two "Twins" of 18 yd. struck capacity, to move most of the million yds. on a rush project for the Corps of Engineers in North Carolina. The job has a one year deadline but was nearly 50% complete in 90 working daysthe productive capacity and versatility of the combination Euclid fleet really made the dirt fly! Material ranged from wet sand to tough hardpan laced with cypress roots and stumps. Hauls average a mile over roads with high rolling resistance -often exceeding 15%. The power and traction of "Euc" Scrapers and their rugged dependability has enabled these contractors to set a fast pace on a difficult job that seemed impossible for large capacity self-powered scrapers.







# For Better Ice and Snow Control Next Winter...

A PLAN OF ACTION NOW!

AND PLAN ITS DISTRIBUTION TO
STRATEGIC STORAGE POINTS



THE BIG COST VARIABLE in your budget is for man-hours of crews and equipment. If, under emergency conditions, they must haul salt cross-town or cross-country to get it to where it's needed—your costs go up.

Sterling Rock Salt... ordered now... and distributed to your key pick-up points in advance... avoids costly waste motion of crews when the storms come. Your men and machines are a striking force... not a supply train.

And don't worry about storage losses, either. The free booklet, offered below, shows many ways Sterling Rock Salt can be stored easily, safely and economically . . . indoors or outdoors . . . without loss.

Avoid Last-Minute Confusion! Save Money!

STERLING AUGER- ROCK SALT

INTERNATIONAL SALT COMPANY, INC.

Scranton, Pennsylvania

Atlanta, Ga. • Chicago, III. • New Orleans, La. • Baltimore, Md. • Boston, Mass. Detroit, Mich. • St. Louis, Mo. • Newark, N. J. • Buffalo, N. Y. • New York, N. Y. Cincinnati, O. • Cleveland, O. • Philadelphia, Pa. • Pittsburgh, Pa. • Richmond, Va.



Save money by using trucks and crews in slack periods during the next month or so to place Sterling Rock Salt under protective covering at key locations . . . where you want it when you'll need it.



When storms hit, streets and roads are cleared promptly. No last minute confusion. No duplication of effort—or of costs in transporting and handling rock salt. It's already there, where it's needed—according to plan!

Send for FREE Booklet,
"HOW TO PROVIDE LOW-COST
ROCK SALT STORAGE"

11 ways to store safely, economically indoors or outdoors.

# In a Single Mississippi County

# **An A-W Power Grader Finds These TEN DIFFERENT Things to Do**

and does each superlatively well thanks to A-W's exclusive All-Wheel Drive and All-Wheel Steer

Whatever the problem ... whatever the job ... one of those pictured on this page, or dozens of others, you can do it better with an Austin-Western Power Grader.

All-Wheel Drive provides 30% more Power-at-the-Blade; keeps the front end of the grader under control at all times. All-Wheel Steer makes the grader twice as maneuverable. Rear Steer shifts the rear truck from side to side, for better traction and smoother operation.

The tougher the job, the more outstanding the performance of A-W "88" and "99" Power Graders in comparison with ordinary front steer, rear drive machines.



All-Wheel Steer carries continyour ditch cuts around corners.



Six powerful driving wheels provide maximum flotation in oft or sandy soils.



Blading in reverse is very much easier with All-Wheel Steer.



Fingertip hydraulic rear steer makes it easy to maneuver around obstructions.



All-Wheel Drive holds machine and blade steady on rough, badly eroded banks.



No tire marks on this wide shoulder, thanks to rear steer.



Controlled traction moves big windrows, farther and faster



makes it easy to ride steep banks, when finishing.



Rear steer helps the blade do a fine job of gravel maintenance



faoting when pulling wet ditches, after a rain.

in-Weste

**Power Graders · Motor Sweepers** Road Rollers - Hydraulic Cranes Construction Equipment Division



Manufactured by AUSTIN-WESTERN COMPANY

Subsidiary of Baldwin-Lima-Hamilton Corporation

AURORA, ILLINOIS, U.S.A.

### EFFICIENCY OF TANDEM ROLLERS GREATLY IMPROVED WITH ROLL-O-MATIC DRIVE

An entirely new concept of effective driving power is claiming the close attention of contractors as well as highway and street department officials. The intense interest in this new drive (called ROLL-O-MATIC) has developed because its use brings about definite economies that mean more profits or a "bidding advantage" for contractors, and more surface rolled within the maintenance budgets of highway and street departments.

The ROLL-O-MATIC DRIVE is available on Galion 5-8, 8-101/2, 8-12, and 10-14 Ton Variable Weight Tandem Rollers equipped with gasoline engines. GALION is the first to offer a complete line of Tandem Rollers with ROLL-O-MATIC



### What It Is . . .

The ROLL-O-MATIC DRIVE is a highly efficient combination of fluid coupling and torque converter which automatically and smoothly multiplies the engine driving force by means of oil in motion instead of by transmission gears, Power multiplication is greatest when the need is greatest.

ROLL-O-MATIC DRIVE must not be confused with fluid couplings or fluid drives. All fluid couplings or fluid drives operate only as fluid clutches. They cannot increase engine torque on the drive shaft, only transmit it.

GALION ROLL-O-MATIC DRIVE serves not only as a fluid clutch, but also multiplies the driving force by means of a torque converter - thus serving in addition as an automatic fluid transmission. General Motors- Allison Torque Converter

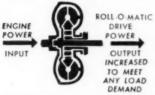
### What It Does . . .

The ROLL O . MATIC DRIVE in Galion Tandem Rollers makes possible an amazing reduction in fuel consumption; greatly reduces wear on engine, forward-reverse clutches, and bearings, shafts and spur gears that compose the final drive. Furthermore, it cuts down-time and costs for maintenance. It offers unequaled ease and simplicity of roller operation, permitting operators to do more and better work. Galion ROLL-O-MATIC Tandems set a new standard in roller performance as well as in quality and amount of rolling accomplished.

- FOR LITERATURE -

### ANALYSIS OF ROLL-O-MATIC OPERATION

### 1. MORE THAN TWICE THE NEEDED POWER IS AVAILABLE



Power is never found lacking for widest range of work or for emergencies. ROLL-O-MATIC\* multiplies torque power on drive shaft in accordance with the need.

### 2. UP TO 25% SAVING IN FUEL

CONVENTIONAL DRIVE TANDEM ROLLER



GALION ROLL-O-MATIC TANDEM



Because of automatic control, engine speed is never in excess of requirements for the load. When the engine should idle — it idles. In addition, torque multiplication within the ROLL-O-MATIC DRIVE reduces demand on the engine.

### NO GEARS TO SHIFT



NO MASTER

Time is saved and the operator is allowed to concentrate all his attention on precise and effective maneuvering of the roller. All shock loads are eliminated.

## 4. NO ENGINE THROTTLE



NO ENGINE STALLING

The engine speed increases or decreases automatically to meet the driving power required. No stalling or harmful engine lugging.

### ONE LEVER OPERATES VELVET-SMOOTH TRAVEL REVERSE



When reversing direction of travel, the operator just makes a simple movement of a convenient lever. The ROLL-O-MATIC DRIVE absorbs the build-up of roller inertia, and the transmission from forward to reverse is quick, smooth, and without shock to drive mechanism.

#### 6. ROLLS 10% MORE SURFACE PER DAY

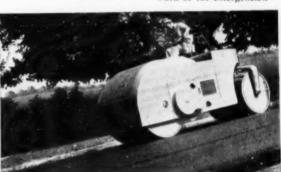
Actual tests prove the Galion ROLL-O-MATIC Tandem can roll at least 10% more surface in any given period of time, because of the wide range of working speeds and faster reversing at the end of each pass.

- 7. ENGINE LIFE INCREASED 35%
- 8. LIFE OF FORWARD-REVERSE CLUTCHES INCREASED 40-50%

All the wearing shocks, strains and stresses which are transmitted by the conventional gear transmission throughout the drive train are completely eliminated in the ROLL-O-MATIC DRIVE.

### 10. ROLL-O-MATIC DRIVE UNIT This power-multiplyi

This power-multiplying drive unit is the culmination of several years of research, testing and proving. Whenever more (or less) power is needed to maintain a uniform rolling speed, the GALION ROLL-O-MATIC DRIVE provides the exact amount — automatically. This is not a conventional transmission where gear must be shifted manually. Power is never found lacking for the widest range of work or for emergencies.



### 11. EFFECTIVE ENGINE BRAKING POWER

On downhill grades the braking power of the engine is available just as it is with gear shift drives — but is smoother, more effective, and more dependable.



#### 12. LOW PROFILE, STREAMLINED DESIGN

Housing design provides unmatched full-width vision and the sprinkler tank does not rise above the compression roll housing.

Gear shift type Galion Rollers are also available with either diesel or gasoline engines.

### 9. AUTOMATIC ROLLING SPEED CONTROL

The desired rolling speed is selected by the operator by means of a convenient governor control lever. This rolling speed is automatically and closely—



Rolling speeds as low as 8 mph and up to 5.5 m.p.h. are possible with Galion ROLLOMATIC Tandems.

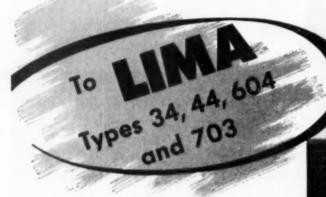




-WRITE THE GALION IRON WORKS & MFG. CO.,

GALION, OHIO, U.S.A.

# Wheel Mounting adds EXTRA CAPACITY GREATER MOBILITY



### COMPARE!

No other machine gives you as much as LIMA!

- All gears, smaller parts and shafts which are subject to extra wear, are flame or induction hardened for longer life.
- Main machinery is placed well back of center of rotation, to eliminate excess counterweight.
- 3. Anti-friction bearings, used at all important bearing points, reduce destructive friction, fuel consumption and lubrication requirements.
- 4. Big capacity drums and sheaves, lengthen cable life by reducing the need for double wrapping and sharp bends in cable.
- 5. Propel and swing gears and power take-off, are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
- Torque converter (optional), automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster.
- Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts, to keep your LIMA on the job continuously.

Illustrated above is the LIMA Type 34 mounted on wheels to provide the advantages of better mobility and extra capacity where ground conditions permit its application. Four sizes are now available with wheel mounting—the Types 34, 44, 604 and 703. Wheel mounted Type 34 has a crane capacity of 20-tons. Wheel mounted Type 44 has a crane capacity of 25-tons. Wheel mounted Type 604 has a crane capacity of 35-tons. (Capacities rated with outriggers supported.) In these units one engine powers all operations, including travel, and one operator controls them all from his cab. LIMA wheel mounted machines are ideal for many material handling operations requiring constant movement around the job. They will save travel time and reduce cost of moving machine between scattered job sites—often justifying the use of equipment on even the smallest operation.

#### TRUCK MOUNTED MACHINES ALSO AVAILABLE

You can now also get the LIMA Type 34, 44, and 604 in a truck mounted unit, with separate engine for traveling between jobs at speeds up to 31 MPH. Crawler-mounted LIMA machines are available in Shovel capacities from 3/4 to 6 yds., Cranes to 110 tons and Draglines variable.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

LIMA

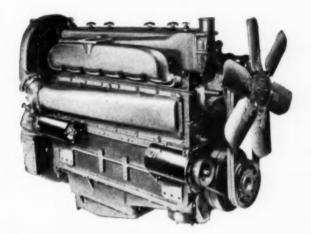
SHOVELS • CRANES
DRAGLINES • PULLSHOVELS



BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

Construction Equipment Division

# 300 HORSEPOWER



# in GM 6-110 diesel engine

## Improved Design Gives Still More Power Per Pound From Same Size Unit

Want more power—and production—from your heavy-duty equipment? Stymied because you can't fit a higher-horsepower Diesel into your units?

Now you can get the power you need—and the increased production you want—with a new 300-horsepower General Motors "110" Diesel—the engine that delivers more torque in the working range. And, you can get them with no increase in engine size or weight.

Higher horsepower means faster operating speeds—high torque means more working power—for operators of all kinds of heavy-duty units.

In off-highway trucks this combination means better hill-climbing, more trips per day, bigger pay loads,

In shovels it means faster digging and loading, more yardage, lower maintenance costs.

In drilling rigs it means more hole per day, faster round trips.

In tractors it means more power for pulling, pushing or "dozing."

Get full details on the new, more powerful GM Series 110 Diesels from your GM Diesel distributor. Have him show you that GM Diesels cost less to buy, less to run and less to maintain than any other Diesel.



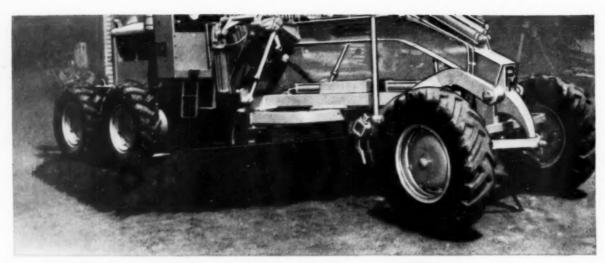
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GENERAL MOTORS • DETROIT 28, MICHIGAN Single Engines . 16 to 300 H.P. Multiple Units . . . Up to 864 H.P.







## More Than Enough Power to Swing Full Moldboard Loads, Yet Gentle As a Lamb for Fine Grading — that's SPEED GRADER!



If you've kicked around motor grader specifications, chances are you've kicked around motor grader specifications, chances are you have concluded that there are only two really important yardsticks: 1. Does the grader deliver the kind of power needed to do every conceivable job? 2. Will this grader rid us of downtime for unnecessary maintenance? Consider Speed Grader. It delivers so much power you can swing full moldboard loads

360° without jamming circle controls! Yet, when you want a tea-party touch for fine, exacting work, Speed Grader's trepower is readily bridled. Maintenance downtime? What's built right, works right—the four key features below show Speed Grader's superiority on this point. Bulletin P136 enlarges on the advantages of having these features. Ask for it!

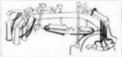
### STRONGEST FRAME



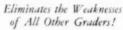
### **HEAVIEST TANDEMS**



### HYDRAULIC CONTROL



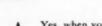
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Yes, when you compare Speed Grader feature for feature with all other leading motor graders, you will find that no other single grader has all 17 features Speed Grader offers. Write for Bulletin No. P136 showing these 17 features. Complete specifications for the five Speed Grader sizes will also be sent. You'll see why Speed Grader offers a wonderful profit future to you.

### ROADS AND STREETS

# Washington News Letter



By Duane L. Cronk

August 7, 1954

President Eisenhower's proposal that America invest an additional \$50 billion in her highways over the next 10 years surprised most of Washington, as well as the rest of the nation. It has been a long, long time since a President has had so much to say about the matter of roads.

Highway men here are used to seeing multi-billion-dollar figures tossed around, including the sum thrown out by the President, but it's one thing to see them in an economic report and another thing to read them - big and bold - in newspaper headlines.

When the initial shock had passed, the Washington Corps of highway experts, stationed here to represent the dozens of highway interests, reacted swiftly. Their responses were anything but uniform.

"Just a trial balloon," was a cynical first comment. Many felt that Ike had no more definite plan in mind than his talk revealed. "He just threw out a figure to see if it would float or sink."

\* \* \*

But most took the proposal seriously. The President of the United States does not just talk off the top of his head to an assembly of 48 governors, they said.

"The President has made an offer and issued a challenge...," said A. E. Johnson, president of the American Association of State Highway Officials.

"President Eisenhower has put us another big step toward the peak of another great good roads movement," opined J. O. Mattson, president of the Automotive Safety Foundation.

\* \* \*

Why the proposal came at this time, and as it did, is still another unknown factor. Many claim that the President wanted to put the governors on the spot - to make them face up to their responsibilities as directors of the road system.

Some point to new civil defense decisions which call for evacuation of large cities in cases of enemy attack. Existing urban "escapeways" are totally inadequate now for that task.

Some believe the President is considering a huge highway construction program to stave off any possible recession.

(continued on next page)

Others echo the opinion of Carl Fritts of the Automotive Safety Foundation. Mr. Fritts points out simply that recognition by the President of the highway situation was inevitable:

"I think that President Eisenhower realizes that our highway system is basic to our economy now, that it is outmoded, and that if he can free it from some of its inadequacies, he will be doing a great deal to stimulate the whole economy."

\* \* 4

Whatever the reason, there are already indications that Ike really does want "a grand plan." His appointment of a top cabinet committee to study anew the nation's transportation facilities followed on the heels of his speech to the governors. And Eisenhower wants their recommendation soon - by December 1.

Up on the Hill, Congressman J. Harry McGregor of Ohio, long-time advocate of good roads, sees a comprehensive airing of every feasible plan to finance the needed highways.

\* \* \*

On the Senate Side, Senator Francis Case of South Dakota, chairman of the Public Works Committee, has introduced a resolution embodying part of what Ike had strongly urged in his speech - planning of better cross-country highways. The Senator called for (1) two transcontinental highways, one to run East and West and the other, North and South, and (2) creation of a Federal Highways Commission to plan design, construction, and financing of such routes.

President Eisenhower opened the door to bold proposals when he advocated consideration of self-liquidating projects. Other schemes will undoubtedly be advanced - some based on increased federal aid, some on bond financing, and some on federally guaranteed loans.

\* \* \*

A fresh approach in Chamber of Commerce policy thinking on highway construction is expected from a newly formed Chamber committee. Headed by Martin Watson, a highway contractor and former president of the Associated General Contractors of America, the 40-man body will make recommendations on promoting highway construction. Others on the committee with highway interests are Carl Franks, president of the Portland Cement Association; George Koss, Iowa road builder; Pyke Johnson, past president of the Automotive Safety Foundation; and Frank McCaslin, president of Oregon Portland Cement Company.

### HERE'S HOW YOU SAVE WITH FORD TRIPLE ECONOMY



Make Courtesy your Code of the Road!

# You get <u>more</u> of the features you need <u>most</u> in a New FORD TRIPLE ECONOMY TRUCK!

Here's proof. Your Ford Dealer can give you plenty more!
(Or write Ford Division, Ford Motor Co., Dept. T-14, Box 658, Dearborn, Mich.)

FEATURE	FORD T-800 TANDEM	TRUCK A	TRUCK B	HOW YOU BENEFIT
Engine				Greater concentration of power! Ford offers more
Horsepower per cu. in	0.536	0.379	0.415	horsepower per cubic inch of displacement, Smaller
Piston Stroke (in.)	3.50	4.50	5.00	displacement usually means less gas.
Piston Speed ft. per min. (at 3000 rpm)	1750	2250	2500	The slower piston speeds of Ford's Short Stroke design cut piston travel, reduce wear, increase engine life.
Free-turn Intake and Exhaust				cot piston travel, reduce wear, increase engine inc.
Valves with Integral Guides	Yes	No	No	Free-turn valves with integral valve guides let valves run cooler, last up to 50% longer!
Cab & Centrols				Only Ford offers Power Steering as standard equip-
Power Steering Standard	Yes	No	No	ment. Cuts steering effort as much as 75%.
Glass Area (sq. in.)—				Ford's "visibility unlimited" means greater truck-
Windshield	938	841	735	driving safety, ease and comfort for the driver.
Total Std. Cab	2103	1705	1709	
Seat Shock Snubbers	Yes	No	No '	Only Ford has these two driver-saving features—seat shock snubbers and woven plastic uphoistery—that are
Woven Plastic Upholstery	Yes	No	No	tops for a smoother, cooler, more comfortable ride.
Chassis				Money-saving, trip-saving capacities are an important feature of all Ford Triple Economy Trucks.
GVW Rating (lbs.)	40,000	38,000	39,000	
Payload-Body Capacity (lbs.)	29,943	26,067	26,735	Ford's front axle capacity exceeds all other makes by
Front Axle Capacity (lbs.)	9,000	7,000	8,000	as much as 2000 lbs. for greater dependability, safety.
Total Rear Spring Capacity	2,000	1,000	2,000	Greater spring capacity is another example of Ford's
(lbs.)	31,100	30,940	26,000	sturdier construction for bigger payloads, longer life.

All chart information is based on latest data available as of 6-30-54 and is believed to be reliable but is not guaranteed.

# EVEREADY CONCRETE

Ask Your EVEREADY Dealer for the Most Complete Line of Masonry and Concrete Cutting Equipment

We've taken the **PUSH-PULL Out of Concrete Sawing** 

"POWR-DRIVE" smoothly drives saw forward at your controlled speed...saves operator effort and increases cutting footage per day. With "POWR-DRIVE" you can instantly regulate the cutting speed to your various cutting requirements.

Two obrasive-coated wheels act as a friction drive in contact with both rear saw wheels. "POWR-DRIVE" is engaged or disengaged by a convenient foot lever control. See the amazing Eveready "POWR-DRIVE" Concrete Saw at your local Eveready Dealer.



Shown at the right are three exclusive features that make EVEREADY the fastest, most efficient concrete and asphalt cutting saw. Other features are: Dashboard controls for greater ease in oper-ation and maneuvering; blade depth control that permits sawing to a specified depth.



The "POWR-DRIVE" Kit comes completely assembled . . . only four holes-four bolts are needed to install the kit on any Eveready Concrete Saw. "POWR-DRIVE" Kits are sold only by authorized Eveready Dealers.

"POWR-DRIVE" cuts MORE Concrete Every Hour ... Cuts Costs on Every Job! and EVEREADY'S "PROVEN QUALITY" Your Guarantee for "PROVEN RESULTS"!

### **EVEREADY** Concrete Blades EVEREADY RED-I-CUT DIAMOND BLADES

For faster cutting — PLUS maximum blade life — regardless of the type Concrete or Asphalt cut. Red-I-Cut Blades fit EVERY make and model saw.

### EVEREADY TUFFIE CONCRETE BLADES

Cut Green Concrete at ONE-THIRD the cost! The NEW "TUFFIE" Abrasive Blade, reinforced with steel wire-mesh, cuts new highway slab — ALL "Green Concrete" slab — at unbelievable savings in labor and blade cost. Your dealer has it NOW!



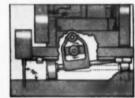
FREE BOOK

FREE BOOK on Masonr more than 18,000 ted

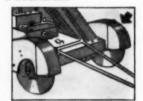




Two easy strokes of Hydra-Eze Handli (A) and hydraulic power lifts blade fast --straight out of cut. Quarter turn of Hydra-Eze Blade Release Lever (B) and hydraulic power feeds blade gently, smoothly into material.



On rough or uneven surfaces—the blade on an EVEREADY Concrete Saw always cuts in a perfect, true, vertical plane TRI-MATIC BLADE ALIGNMENT prevents binding, twisting, or tilting of the blade as the saw moves over uneven or broken surfaces.



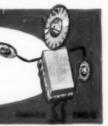
Place blade on either side of saw to cut in corners and confined areas. Blade guard, water hose, and front guide wheel marker assembly are all inter-



in Most Principal Cities in the United States and Canada 🌑 Write for the Name of Your Nearest Dealer.

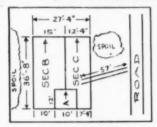
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### 4 Basements Dug In 9 Hours and 25 Minutes

Young and Dietrich, new, aggressive excavating contractors in Painesville, Ohio, were awarded a contract recently to dig 10 basements and sewer trenches in a new small-home development. A time study was made of the first 4 base-- they were all dug in 9 hours and 25 minutes with a Lorain TL25-J Hoe using a 36" wide, %-yd. bucket. The excavations varied slightly in size, but here are figures on one basement.



Dimensions 36'8" x 27'4" Sewer	x 5' deep
Sewer Line 57' long x 3' wide Start Sewer Line	1:56 A.M. 55 mins.
Total	114 mins.
Basement	
Start Section A Finish Section A	
Total	20 mins.
Start Section B	2:35 P.M.
Delays (backfill sewer trench) Finish Section B	10 mins.
Total	80 mins.
Start Section C	3:57 P.M.
	5:05 P.M.
Total	68 mins.
Total for Basement No. 4  4 HRS., 42 MINS. Seewer actual digging time digging time 2 1 Time to backfill sewer 2 1 Delays — Lunch Searching for outlet	e59 mins. hrs. 38 mins. 10 mins. 30 mins.

Basement No. 1 was dug in 2 hours and 11 minutes plus 35 minutes delay for checking grade and installing water line.

Basement No. 2 took 2 hours and 15 minutes plus 37 minutes delay for checking grade and cleaning up cave-ins on basement No. 1.

Basement No. 3 consumed 2 hours and 21 minutes plus 27 minutes delay for discussion between overator and contractor.



As basement No. 2 is finished at 3:12 P.M. the onerete footers are already being poured for asement No. 1 which was finished just 3 hours nd 43 minutes earlier.

The above figures were secured on actual on-the-job operations. Nothing was planned. Nothing was staged. Production figures like these make basement digging profitable. Lorain TL25 Hoes match them all over the world. Advertise



# HERE'S HOW TO "KEEP OUT OF THE HOLE"

### WHEN YOU DIG BASEMENTS

You won't get in the hole on costs if you use a TL-25 Hoe for basement digging, because you can work from the top to cut straight sidewalls, trim square corners and grade level floors to reduce hand finishing. You can spoil pile in any direction, dig utility trenches, and forget the problems of building ramps and the high maintenance of constant travel that is necessary with some types of equipment. TL-25's consistently dig an average residence basement in 3 hours or less. And when you get other types of jobs, it is easy to change to a dragline, clamshell, shovel or crane front end to handle them profitably. Many contractors started their careers with this versatile machine that is so adaptable to their growing needs.

There are many reasons why a TL-25 will throw more dirt per day-at less cost. Call your Thew-Lorain Distributor today for the full story.



#### WILL KEEP YOU "ON TOP" OF PROFITS

Here's why! High-speed, balanced operating cycle, easy-to-service, hydraulic tread-travel lock, anti-friction bearings, 4 crawler sizes to choose from. Inexpensive to own. These are but a fewl

THE THEW SHOVEL CO., LORAIN, OHIO

WRITE FOR HOE BOOKLET — showing many uses of Lorain Hoes of all sizes on basements, sewer lines, utility lines — jobs that will make you money. Ask for Hoe Booklet.



TO BEST FIT YOUR JOB FOR PROFIT!



Yes, Heltzel Forms
are truly "Formsetters'
Forms". Quick aligning,
fast, sure locking, single
wedging . . . and easy driving
rerolled rail stakes combine to
permit the formsetting crew to
do the best job in a minimum
of time.

And, the wide track surface, supported at five separate points, the upturned flange\*, plus the tough carbon-manganese

steel give contractors the strongest, most serviceable form available anywhere. Forms illustrated on this page are (top) the Heltzel Standard Road and Airport Form, and (bottom) one of several styles of the popular Heltzel Dual-Duty Form that combines two standard paving heights in a single form, with or without dowel installing feature.

\*Also available without flange.

Write today for your capy of the fully illustrated booklet STEEL FORMS BY HELTZEL. Send inquiries to Heltzel Forms, Thomas Road, Warren, Ohio.

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# AIR CONTROLS mean you'll Move More with a MICHIGAN

Get right into the cab of a MICHIGAN\* excavator-crane, stand behind the operator—and get an eye-full of the right way to get more yardage.

Notice how easy it is to operate these air control levers! Notice the sure, light touch, and the instant response of clutch rams—the swift thrust of massive power—the fast, smooth swing—the perfect "feel" of the load throughout the full operating cycle. They add up—to bigger yardage!

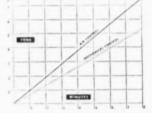
By saving seconds on every operating cycle, your air-controlled MICHIGAN can add as much as a full working hour or more to a day—and adds substantially to the amount of profit-making work done. Equally important, Air Controls are easy on the operator—don't tire him, keep his efficiency high all day.

By all means, get and read "More Yardage Through Air Power"—an attractive illustrated book that tells the full story of MICHIGAN Air Controls. A copy of it is included in the MICHIGAN "24" Fact Folio—with specifications and action photos. The coupon brings your copy—promptly.

#### COMPETITIVE TEST PROVES AIR CONTROLS FASTER

"Recently another company rented our MICHIGAN—and ran a lest against their own mechanically operated crane. The machines were of equal capacity—the operators judged equal in skill."

"In 8 minutes the MICHIGAN loaded 7½ tons, against 5¼ tons by the other machine—a 43% victory for Air Controls." Suisman & Blumenthal, Hartford, Conn.



\*A Trademark of Clark Equipment Company

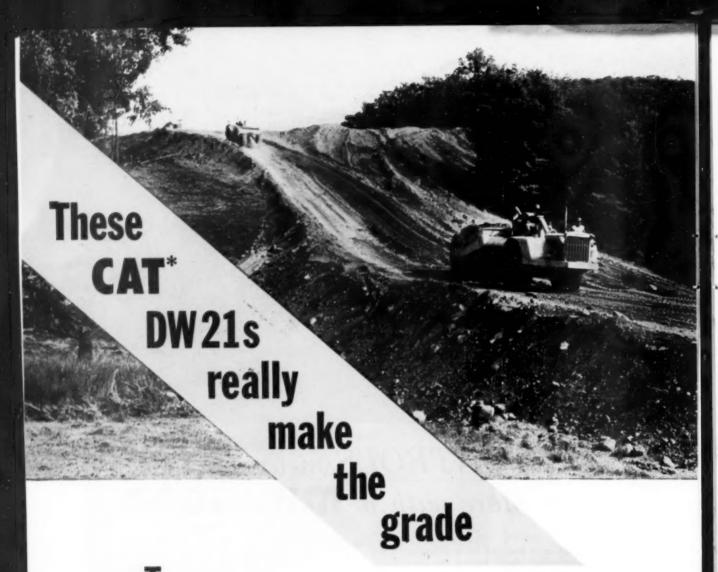


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HAT's a 28% grade these Caterpillar DW21 Tractors with No. 21 Scrapers are working.

They're starting an 85-foot cut through sandy clay and boulders. The DW21s load on the level, haul downhill, then scoot back up that slope for more.

"A steep grade like this is certainly a tough tryout for any rubber-tired machine," says Oscar Lindstrom, superintendent for Victor Nelson Construction Company, "but those DW21s take it in stride. They're about the best earthmovers you'll find on rubber."

Here, southwest of Slinger, Wisc., constructing a new grade and right-of-way for U.S.-Wisconsin No. 41, each of four Cat DW21 Tractors is moving 250 yards an hour—830,000 yards in all. "They handle a great deal of payload in a day," says Superintendent Lindstrom.

Other users say much the same. One reason: the DW21 is the only two-wheel earthmover designed and built by one company—every part matched to deliver peak performance on the job.

Another: its 225 HP is all there at the flywheel. As Mr. Lindstrom points out, here's one rig that won't smother on grades.

And a third reason: always handy with prompt, genuine parts service is your Caterpillar Dealer. He'll be glad to demonstrate this high-speed, high-capacity, big yellow machine any time you say.

Caterpillar Tractor Co., Peoria, Ill., U.S.A.



NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

# Two Bridge Finishers PAVE OHIO TURNPIKE'S LONGEST STRUCTURE

2,682-ft. twin roadways paved under Turnpike specifications designed to assure a smooth riding deck.

DECK paving methods were being watched with interest this summer on the Cuyahoga River Bridge, southeast of Cleveland, largest of the 350 bridges under construction on the Ohio Turnpike project. Two mechanical bridge deck finishing machines, one on each of the 2,682-ft. twin structures, were being used under turnpike specifications which set uprigid finishing requirements for turnpike roadway bridges.

The \$5%-million bridge was constructed under substructure contract with Horvitz Company, Cleveland, and steel fabrication and erection contract with Bethlehem Steel Company. Industrial Construction Company, Minneapolis, Minn., subcontracted the concrete deck.

The bridge is actually two closely parallel but separate structures, one for the eastbound and one for the westbound roadway. The substructure is notable in that it includes several high piers, the tallest rising 133-ft, above the valley floor. The superstructure for each bridge consists of four 100-ft, deck plate girder spans comprising six girder lines spaced 6

ft. apart, and nine 250-ft. deck truss spans with truss lines on 30 ft. centers. Some 6,500 cu. yd. of concrete and 17,400,000 lb. of structural steel were used in the project exclusive of deck construction.

The deck structure for each bridge consists of a 30-ft. roadway, 18-in. sidewalks and parapets. The deck slab is 8½ in. uniform thickness.

The contractor for the deck elected to supply the job from a highway passing under the bridge 100 ft. or more below. A tubular steel stairway tower with wood safety steps was provided for personnel.

Deck concrete was dry batched in a Heltzel 4-bin plant near the job, using a Lorain TL-25 crane with %-

• Deck finishing in progress on one of the twin decks of the Cuyahoga River bridge, as seen from the other deck.





 Concrete for deck paving was mixed in a paver at base of tower, hoisted, and transported by buggies. Note movable construction bridge connecting the two bridge roadways.



yd. bucket on stockpiled aggregates. Batch trucks hauled to a Koering 27-E stationary paver located under the bridge adjacent to a hoist tower. Mixed concrete was hoisted by a 1-yd. bucket, using a Minneapolis-Moline Model HUA gas-powered winch.

At the deck level concrete was spouted into gasoline powered buggies, consisting of 3 Whiteman 1/3-yd. units on each bridge, and transported over temporary wood platform to point of deposit, where it is dumped from a rail mounted traveling platform. Concrete was manually spread and vibrated ahead of the finisher.

Two Flexplane bridge finishing machines were employed, one for each roadway as noted. These oscillating screed machines with adaptable width were adjusted for the 30-ft. roadway portion of the slab in the initial operation. The central width was poured against wood. The procedure was to complete this width over the entire length before coming back to concrete the walk and parapet strips, which were struck off and finished manually.

An interesting feature of the work was the method of supporting the finishing machines. In lieu of the usual form rail for road paving, 6-in. Ibeams in 25-ft. lengths were used as runner rails. These rails were supported at 5 ft. intervals by pairs of % x 14 in. bolts set in nuts welded on the chord flange. The rail was carried on steel plates mounted between the bolts. The rail alignment was controlled by setting the bottom flange of the rail between welded fillets (see sketch), and anchoring the rail down by a third plate extending over the flange toe. This scheme saved labor and permitted very accurate control of rail elevation and alignment, thus meeting the first essential to getting a smooth riding

The supply of bolt units and runner rails was sufficient to allow for one day's paving, one day's curing, and one day's supply ahead of the paving operation. The rails and bolt support units were removed after the concrete had cured for 24 hours. Upon removal, the rails and supports were moved forward on the job and the holes plugged with concrete.

The proposed schedule called for the paving of two 250-ft. truss spans or equivalent per week. By placing one finisher on each bridge roadway, the contractor figured to keep the operation moving smoothly and eliminate as much delay as possible. This scheme allowed the paving to be performed continuously from one supply source, alternating between spans on alternate days. A temporary construction bridge connected the two decks. This meant that, excluding delays, the twin roadways could be finished in one month. While the paving was being done on one span, workers could be removing the runner rails from the previous day's pour and setting the rails for the following day's work.

Approximately one cubic yard of concrete was required for each lineal foot of roadway. In the 10-hour period required to pave a 250-ft. span the material handling requirements involved 80 batch truck loads, 250 one-yard lifts of mixed concrete and 750 buggy loads to the paving operation.

### **Deck Form Details**

The deck forms were made up of % in. plywood sections of 5 ft. wide and 8 ft. long supported on 2x6 stringers on 24-in. centers. The stringers were supported at each end by two 2 x 6 runners bolted to a hanger clip across the top of the wide-flange top chord members.

In assembling the forms, the 2 x 6 runners were loosely threaded into the hanger pins and the stringers set in place. The bolts were tightened, which snubbed the stringers against the flange of the top chord member. The plywood sections were nailed in place on the stringers.

A 6" x 6" x 10' beam bolted to the bottom flange of the outer two top chord members, served as the only support for the cantilevered sidewalk and parapet wall. Because of the spacing of these beams, it was impossible to remove the forms in the full 24-ft. section. In disassembling the forms, the hanger bolts were knocked loose and the runners, stringers, and plywood sections dropped and pulled to the deck. From this point the forming was moved forward and reconstructed ahead of the paving operation. The only materials lost in the forming operation were hanger clips imbedded in the slab.

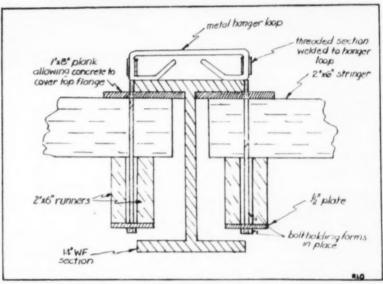
#### • Chain drive on Flex-plane finisher.





 Buggies were carried on wood platform panels to a rail-mounted dumping bridge in front of the finisher.

### CROSS SECTION OF FORM SUPPORTS



• Details of a typical form panel, designed for easy removal and re-use.

Most significant was the method in which the roadway slab was poured and finished. The Flexplane machines, specially designed for bridges and elevated highways, solved the common deck finishing problem of "too much equipment and too little working space." Designed to pave in widths of 32 to 40 ft., this finisher has a 3-wheel drive and adjustable

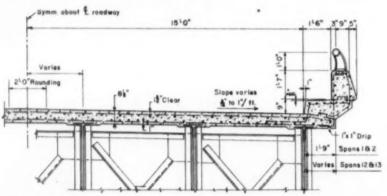
 Flex-plane bridge finisher, set up ready to start a pour. A similar machine also used for the other deck. Note rail supports in position at far left, and rail being set.



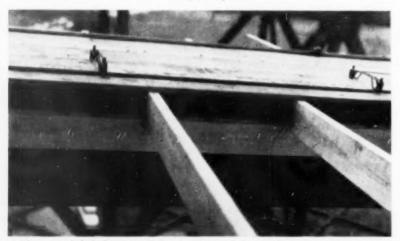
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• Concrete was dry batched here for the deck paving.



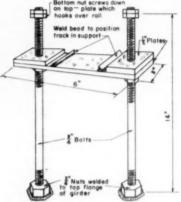
• Cross-section of concrete deck for the girder spans.



 Elements of deck form panel shown — clips, bolts, 2x6 runner, 2x6 stringers; and 6x6 bolted to bottom flange for supporting outer 3 ft. of form for walk and parapet.



 Another view of the welded-belt rail supports. Also note wood form in place for the 30-ft, central pour.



Detail of welded bolt assembly, designed to support equipment rail.

barrier trucks which allows the wheels to be placed from 30 to 53 in. above the finished slab. Ratchet screeds permit a 3-ft. extension on each side. The working surface of the screed is 20 in. wide and arrangements for an additional screed are built into the rear of the machine. The machine has the flexibility of four speeds both forward and in reverse, with independent screed speeds.

Specifications provide that the surface shall be tested for smoothness by means of a "surface testing machine". The testing of completed deck sections is in progress using a "buzzer" type hand-operated machine.

This unit is mounted on two wheels 10 ft. apart, with a suspended third wheel which causes a battery-operated buzzer to sound whenever this wheel hits a spot outside of the %-in. tolerance.

The bridge project design and supervision is under the J. E. Griener Company, contracting engineers, J. T. Wallace, resident engineer. I. B. Kleven is superintendent for Industrial Construction Co. on the deck paving.

### Roads and Streets in the News

# President's \$50 Billion Road Program Stirs Controversies

THE summer lull following the recent enacting of the 1954 federal aid act, and subsequent early appropriation of the coming year's funds, was punctuated July 12 with President Eisenhower's proposal of a \$50 billion additional highway program for the nation.

Presented by vice-president Nixon at the annual governor's conference, at Bolton Landing, N.Y., the proposal brought immediate and in some instances violent reaction. Governor Fine of Pennsylvania, for example, speaking for the traditional "we don't want federal meddling" attitude of Pennsylvania political leaders, he denounced the President's program as an election-year political move.

Praise came from other quarters, including the Hearst newspapers and also from the American Road Builders Association, which has long advocated a larger highway program than even the present enlarged one. ARBA president Robert M. Reindollar, for-

mer chairman of the Maryland State Roads Commission, noted that "the President's program represented some of the main recommendations which ARBA has repeatedly made to Congress, official bodies and the public."

The program as sketchily outlined calls for a 10-year federal-state cooperative program to cost \$5 billion annually, in addition to the current normal expenditures, for the construction and improvement of the Nation's principal highway arteries. Just what these arteries would include was not spelled out, but they would presumably include the interstate, primary, secondary and urban federal-aid systems as presently designated, as a beginning basis for working out the details. The program was presented as a four-unit one:

"1. A grand plan for a properly articulated system that solves the problems of speedy, safe transcontinental travel; intercity communication; access highways and farm-to-market

movements; metropolitan area congestion.

"2. A financing proposal based on self-liquidation of each project where that is possible — through tolls or the assured increase in gas tax revenues or Federal help where the national interest demands it.

"3. A cooperative alliance between the federal government and the states so that local government — the most efficient sort of government in the administration of funds — will be the manager of its own area.

"4. Very probably, a program initiated by the federal government with state cooperation for the planning and construction of a modern interstate highway system; empowered, for example, to advance funds or guarantee the obligations of localities or states which undertake to construct new or modernize existing highways."

The Chief Executive reported that a committee of his Cabinet has been established to develop a comprehensive transportation policy.

"To start to meet this problem, at this session of the Congress," he said, "we have increased by approximately \$500 million the Federal monies available to the States for road works. Experts say \$5 billion a year for 10 years, in addition to current normal expenditures, will pay off in economic growth. And when we have spent \$50 billion we shall only have made a good start on the highways the country will need for a population of 200 million."

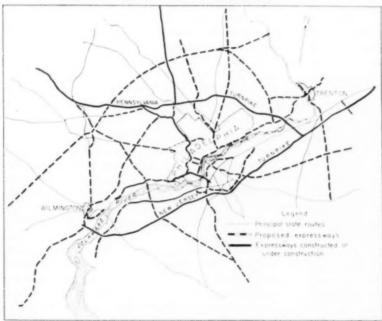
The President noted that the highway system has grown haphazardly and, while overhauled at intervals, never has been planned to meet the needs of the years ahead.

"The increase in mileage has lagged behind the increase in vehicles," he continued. "The road system, moreover, is fundamentally the same, either haphazard or completely arbitrary in its origin; designed for local movement in an age of transcontinental travel."

The President asked the Governors to study the program he outlined and to make recommendations for cooperative action.

•A constitutional amendment authorizing a \$50 million bond issue for highways has been passed by both Houses of the Louisiana Legislature and will be voted upon by the people in November of this year.

### 25-Year Expressway Plan for Philadelphia Area



 Showing the 25 year plan of expressway development in the Delaware Valley around Philadelphia, as announced recently by the Greater Philadelphia-Delaware-South Jersey Council.

# Is This the "Earthquake" We Need

FEW HAPPENINGS in the road field have created such an overnight sensation as President Eisenhower's proposal of an added \$50 billion ten-year roadbuilding program for the nation.

Congress had just passed a record-breaking highway aid bill, and the Secretary of Commerce has advanced the first year's allotments six months ahead of normal schedule. That's that, everyone was saying. Now to settle down to a roadbuilding pace which, while not big enough to really gain on traffic wear and obsolescence, is nevertheless in new high ground dollarwise.

The fact is that except for the toll roads and a few spots in the state programs, we are still tinkering with old road patterns; still merely inching up on a job that calls for seven league boots. As a recent Saturday Evening Post editorial pointed out, we are investing billions in an obsolete highway system, while traffic grows and grows.

The President's proposal may have been timed to stir reaction at the recent governors' conference, but it comes from a leader who realizes the national benefits that a transformation of the road system would bring. Like many congressional leaders he has not forgotten the testimony on highway needs that poured out in the 1953 summer and 1954 spring hearings. This testimony by industry experts, based on surveys, showed that a \$35 billion deficiency not only exists on main roads alone but is actually still growing, despite our present high roadbuilding pace.

• The primary problem with this vast proposal, as with any stepping up of road work, is of course financing. New money must be found from many different sources and each state must begin at once to work out its own problem of raising matching funds. The Federal Highway Act of 1954 provides for a comprehensive financial study, and such a study now being made by the Bureau of Public Roads will be reported to Congress next February.

Many of the states are financially strapped even by their present road programs. Some states could raise new millions by ending diversion, but antidiversion legislation will take time. Revenue bond financing of toll roads can take care of a limited mileage of special projects. The bulk of the \$50 billion job, many forsee, will have to be financed through state and other borrowings, possibly with the federal government stepping in to guarantee or buy up bonds where necessary to secure network progress.

This outlook puts a new emphasis on a principle underscored by the President, namely, the principal of self-liquidation. Soundly designed roads will repay their cost in many ways. Engineers in such states as Oregon have well-established procedures for evaluating road projects and setting up bookkeeping on their ability to return their cost directly through user taxes generated by their traffic. California engineers have gone far to show economic benefits in the form of industrial and commercial growth along new expressway routes. Many studies have been made of the economic loss from traffic accidents, and of the value of modern facilities in saving lives. This type of research has barely begun. With heavy borrowing ahead, the engineer-economist will be the key man in every roadbuilding organization.

Our job of economic justification is cut out for us, as a basis for deriving the complex data needed to enable planners, legislators, banking groups, and finally the public, to make sound decisions in support of highway developments.

On the subject of money, this would seem a poor time, Governor Fine of Pennsylvania, to ask the federal government to get out of the gas tax field. And it would be unthinkable for Uncle Sam to get clear out of the road field, as you also suggest, at a time when a unified road network has assumed such importance to the national defense and the general welfare.

• An interesting perspective on our national road problem was drawn for us by an industry leader. This executive, who is intimately familiar with the International Road Federation and its highway promotion abroad, notes that other countries are building the brilliantly engineered projects of the type we can seemingly get only through turnpike financing.

"We may have the world's best highway network," he said, "but we have few roads as direct and modern as Venezuela's famed new Autopista from Caracas to the sea. We have too few bold new interregional expressways such as are planned for Japan, New Zealand, the Philippines and elsewhere.

"In contrast," pointed out this observer, "we

## to Get a Real Highway Program?

in the U. S. with our ten times heavier traffic are doing little that could be called a fresh start. Little to create new region-to-region highway traffic flow, and too little to solve urban congestion. Relief will follow for truckers and motorists only when the 'road blocks' represented by most of our cities are eliminated and turnpike thinking is applied in state highway system planning."

Actually, a few of the most progressive states already have excellent programs, such that the new \$50 billion proposal could add relatively little. Maryland has a 12-year program worth studying as a guide by all agencies. Arizona is doing a remarkable job. California is out ahead, concentrating on urban and inter-city expressways. Connecticut and Massachusetts have effective modernization programs aided by toll projects.

• Let us turn our imagination loose for a moment and think what a real highway building job would do for the nation and for all of us. The proposed \$5 billion-a-year added expenditure, more than doubling the present \$4 billion construction rate, would have a marked effect on employment and prosperity, by creating jobs on projects and back along thousands of supply lines.

Vastly more important, we would quit treading water and begin soon to get modern, direct, safe routes that would cut transportation time and costs, save thousands of lives, and step up the social and commercial revolution that is being paced by highway transportation.

The President's proposal is announced as a "grand plan." Note that the proposal does not tie itself down to presently designated systems of federal-aid routes, but is broadly worded. It opens the door to fresh thinking in route planning and design as well as financing.

The President's proposal is not a crystallized plan, but really just a bid for the reaction of the state governors to a bold idea of great merit. The governors, state legislatures and state highway departments will finally carry the ball. Many grassroots ideas will need to be heard in the meantime. The Chamber of Commerce of the United States, for example, expects to lay a road and street plan before the President this Fall.

One thing is sure — this is action time. Maybe this is the earthquake that the highway fraternity has needed to help jar it into more forward looking, bigger-thinking mental attitudes.

See that your representatives in Washington and in your state capital have the benefit of your opinion on what this program should include for your state and the nation.

### Why New Billions Needed? We're Not Denting Deficiencies

Latest figures on main highway improvements needed. (American Association of State Highway Officials)

State	Miles Needing Improvement		State	Miles Needing Improvement		State Miles Needi Improvement	ng Cost nt (Millions)
Alabama	7,183	\$ 315.4	Maryland	5,724	\$ 652.0	Pennsylvania 8,652	\$ 1,348.0
Arizona	4,282	229.4	Massachusetts	3,380	961.1	Rhode Island 264	173.9
Arkansas	14,744	616.2	Michigan	17,912	792.1	S. Carolina 8,384	262.5
California	11,061	2,707.1	Minnesota	16,708	614.3	S. Dakota 11,653	354.1
Colorado	2,970	329 9	Mississippi	8,954	272.7	Tennessee 10,547	889.7
Connecticut	1,062	692.1	Missouri	17,410	771.4	Texas 29,304	1,441.3
Delaware	1,386	126.0	Montana	6,177	381.6	Utah 3,799	284.0
Florida	6,765	830.4	Nebraska	8,446	331.3	Vermont 1,785	173.2
Georgia	11.310	840.0	Nevada	2,899	134.5	Virginia 14,481	691.8
Idaho	4,503	265.1	N. Hampshire	1,780	172.8	Washington 6,894	738.4
Illinois	7,832	1.480.2	N. Jersey	2,055	1,664.6	W. Virginia 11,721	1,172.3
Indiana	9.341	727.5	N. Mexico	4,279	296.2	Wisconsin 19.280	
Iowa	24,776	943.8	New York	14,969	2,886.2	Wyoming 2,944	
			N. Carolina	4,667	490.4	Dist. of Columbia 78	
Kansas	14,653	575.8	N. Dakota	11,200	264.1		
Kentucky	16,315	839.3	Ohio	7,100	1,740.0	Hawaii 412	48.9
Louisiana	5,998	422.5	Oklahoma	12,065	765.5	Porto Rico 1,280	230.0
Maine	1,657	157.8	Oregon	6,241	390.6	Total 429,282	\$34,951.3



Representatives of the five state highway departments receiving the first annual "Golden Milestone" Award for outstanding highway program reporting with officials of National Highway Users Conference at Fifth Highway Transportation Congress: Russell H. McCain, chairman, Maryland State Roads Commission; Leroy A. Powers, general counsel, State Highway Department, Oklahoma; Nicholas Kelley, Jr., secretary Chrysler Corporation and chairman, NHUC Award Committee; Albert Bradley, chairman; and Arthur C. Butler, director, and Roy E. Jorgensen, engineering counsel of NHUC; Mark U. Watrous, chief highway engineer, Colorado; H. Gordon Gray, chief engineer, Massachusetts D. of P.W.; and Maurice Van Mechelen, safety director, state highway department of Washington.

### **OUR BIG JOB**

## Selling the "Man on the Street"

### By Duane L. Cronk

Washington Correspondent to Roads and Streets

"Public telling" task of highway departments given new emphasis as result of recent "Golden Milestone" awards presentation by National Highway Users Conference.

THE Highway Transportation Conference, held last May in Washington, has receded as a news event. But the passing weeks have only heightened the importance of this Conference's service in pointing up the highway public relations job.

We refer particularly to the newly established "Golden Milestone" award, an annual affair initiated to encourage and acknowledge superior program reporting by the highway departments. The following notes are presented for Roads and Streets readers who did not attend the Conference or have not had the opportunity to review its principal utterances on the public relations problem. At the Conference—

• Colorado was cited for its sufficiency rating study report of 1953, which "makes a logical and under-

standable presentation of highway needs, with a scheduling of projects on a priority basis," and "summarizes what is being done to meet highway needs."

Maryland was recognized for a program report which created wide public understanding and helped to generate legislative approval of a comprehensive 12-year highway program.

• Massachusetts won an award for outlining progress over the years since 1949 and presenting specifically, with text and maps, what is contemplated for the period 1955-58 in its highway program.

 Oklahoma was lauded for its 1953 reports which "set forth, county by county, with map and tabular presentation, work completed during the past year and projects underway and programmed."  Washington was honored for a report of highway deficiencies, work accomplished in the preceding year, projects underway and work programmed.

Accepting the Golden Milestone awards in behalf of their states were: Mark U. Watrous, chief highway engineer of Colorado; John A. Volpe, commissioner of public works in Massachusetts; Russell H. McCain, chairman of the Maryland State Roads Commission; Leroy A. Powers, general counsel of the State Highway Department, Oklahoma; and Maurice Van Mechelen, safety director of the Washington State Highway Department.

The NHUC awards initiated to encourage business-like reporting by state highway departments for their "customers," the taxpaying, traveling public. The highway users body found in a recent poll that its membership considered lack of public understanding of highway needs the second ranking problem of the industry.

Early in the Congress, Keynote Speaker Albert Bradley, executive vice president of General Motors and chairman of NHUC, called for renewed efforts to reach the "man on the street" with the story of highway needs. In presenting the first-time awards, Nicholas Kelley, Jr., secretary of Chrysler Corporation, declared that good highway program reporting fosters the best of relationships between state road officials and the general public — a prerequisite to obtaining legislative support for highway proposals.

The awards contest calls attention to the increasing emphasis which state highway departments are placing upon public relations activities. Some have taken long strides in the art of selling highway programs.

The New Mexico State Highway Department recently took a poll of the public relations activities of 36 other highway departments. All but one declared the need exists for providing information to taxpayers, although some had not yet been able to initiate such programs.

Twenty-two of the departments reported that they have staff men who engage exclusively in public relations work. The number of PR workers ranged from one to fourteen and the budgets from \$5,000 annually to \$120,000.

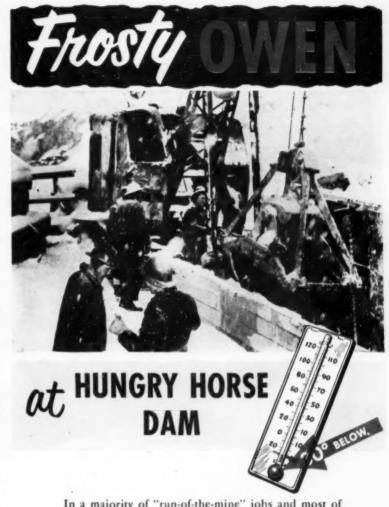
Mass media channels employed to tell the story of these states' highway needs and construction goals included newspapers, magazines, radio, television, motion pictures, brochures and reports. Road officials made themselves frequently available for speaking engagements before business and civic bodies.

A committee on public relations and publicity has been active for several years in the American Association of State Highway Officials. At the 1953 AASHO convention, Art Sherwood, public information officer of the Idaho Department of Highways, declared that public interest in highways is extending from the stretch of road before the individual's home or business establishment to an interest in state-wide problems.

"The public and the press are entitled to know how the highway revenues are being expended," he asserted. "They are entitled to know about the policies, the plans and the problems of the highway department. It is the job, yes, the duty of the highway department to develop a close working relationship with the press in order to give that information to the public and to give it to them correctly and unbiased."

J. G. Morgan, vice chairman, Missouri Highway Commission, told the audience that highway departments must accept a share of blame for the alarming total of highway needs.

(Continued on page 71)



In a majority of "run-of-the-mine" jobs and most of the exceptionally noteworthy projects you'll find Owen Buckets handling important digging and material handling operations.

That is true whether it is a bridge abutment, a dam foundation, caisson work, deep trenching, aggregate handling or "what have you."

The Hungry Horse Dam is an example. Thirty degrees below zero weather didn't stop operations or

hinder this Owen Bucket in performing the desired service required in deep down digging of frozen clay, shale, etc.

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• The Blaw-Knox Bituminous Paver has demonstrated conclusively the superiority of wheel mounting for laying asphaltic mixes. Out of Pittsburgh on both city street work and county road work, the Blaw-Knox Paver laid Pennsylvania specifications ID-2 hot mix at speeds never before equaled. In some cases the machine handled 16 ton trucks on 12% grades with ease. Rubber tire mounting materially reduced the time required for returning the machine for restarts and long wheel base and accuracy of steering, possible only with wheels, produced a smooth, ripple-free surface under the straight edge.

You will want to know more about this new development in bituminous pavers. Ask for the Greentree Road story.

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- Eliminates the 500 to 600 parts characteristic of crawlers.
- Tires absorb vibration, reduce chatter in screed and reduce wear and tear on machine.
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- Dual controls—operate machine
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NYLON in the U. S. Royal Con-Trak-Tor helps you through the heavy going heeps you on schedule!

### **ALL-NYLON STRENGTH**

The Con-Trak-Tor's Nylon cord body withstands murderous impact... means that you get every hour of tire life built into this great U. S. Royal tire.

### TRIPLE IMPACT PROTECTION

The Con-Trak-Tor's built with extra rubber between cord-plies—double shock-pads beneath the tread—tough rock-resisting construction at the crown.

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The Con-Trak-Tor's full-width lug design digs deeper, pulls harder in forward or reverse—actually works where other tires stall.

Prove it. Put the Nylon U. S. Royal Con-Trak-Tor to work—watch your pay loads stay on the move. Your U. S. Royal Dealer has it in your size, for your job.

# NYLON...Keeps Pay Loads Moving !



Bulk cement is unloaded mechanically into hopper at rail siding.



Weighed batches of cement in trucks are transferred to tanker.



Crawler treads on the cement tanker carry it through soft sand.



Water tank was also mounted on special crawler carriage.



Mixing train lays a course of soil-cement base 11 ft. wide.

# Soil-Cement Soil-Cement

# problem and saves \$50,000

Wisconsin highway engineers decided something had to be done about an old section of Highway 54. Spring break-up closed it for long periods every year and maintaining it had become a serious drain on highway funds. Extensive study showed that a new road would be the most practical solution.

The new 21.5 mile route—4.5 miles shorter—was cut through sand hills and swamps and paved with soil-cement.\* Soil-cement pavement was selected because its rigid base can carry normal loads even on soft subgrade in spring thaws and because suitable material needed for other pavements was not available nearby.

Eliminating the expense of hauling material long distances saved \$50,000 alone.

Photos at the left show the simple but ingenious methods and equipment used to facilitate operations in the sandy soil. Despite difficult conditions, paving proceeded at a rate of 3000 lin. ft. per day for the 6-in. thick, 22-ft. wide soil-cement base.

As in Wisconsin, experience in most other states has proved that soil-cement is a logical solution to paving problems for roads not subjected to heavy traffic. More and more, engineers are specifying this low-cost, all-weather pavement for building new highways, for paving shoulders, for widening traffic lanes and for reconstructing old roads.

Soil-cement roads are economical because (1) about 85% of the material is soil on the site, (2) paving is simple and fast, (3) being stronger than other low-cost pavements, it can be built thinner and (4) maintenance is low.

For more information write for free literature, distributed only in the U.S. and Canada.

\*Soil-cement pavement consists of soil-cement base and bituminous surface.

PORTLAND CEMENT ASSOCIATION Dept. 8-28, 33 W. Grand Ave., Chicago 10, III.

A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work



# FRINK V-TYPE PLOWS ARE SELF BALLASTING



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All Frink V-Type Sno-Plows — which will clear the heaviest snow fall — are equipped with exclusive heel adjusting chains which automatically ballast the front end of the truck and prevent side slipping. This makes trucks easier and safer to drive and therefore prevents excessive wear and damage to equipment.

Another factor that makes the Frink push easier is that the cutting edge is built with sufficient shear to raise the snow up and over the adjoining snow and keep it moving at all times.

Frink Reversible Type, One-Way Type, V-Type and the Frink Roto-Broom are interchangeable on the same truck attachment.

For further information on this Sno-Plow, write for catalog to nearest address, Box RS548







### **Extra-powered tractor** snatches Tournapulls

Much has been rumored recently in regard to big super-powered tractors coming on the market. Ed Dea, earthmoving contractor of Palos Park, Illinois, decided not to wait for such models but to soup up some of his D8 Caterpillars.

The tractor shown was photographed doing snatch-bar duty for several Super C Tournapulls, on a second-laning project on U.S. 66 near Bloomington, Illinois. The scoops were being loaded with remarkable speed. On looking closely the reason was found. The engine in the D8 is a 275-hp. diesel taken from a DW21 Caterpillar rubber tired tractor.

Mr. Dea has two such tractors. He puts on quite a show at times in borrow pit loading (not pictured here,







• Special 275-hp tractor on snatch-bar duty.

however) by using each of these special tractors to push load and snatch load two Tournapulls simultaneously.

### 30-inch augers drill footings in rocky soil

Experimentation with truck mounted power augers of large diameter saved time and money on a recent Los Angeles foundation project. The contractor, Mac Isaac and Menke Company, Los Angeles, had the job of putting down footing holes for a large industrial structure in the metropolitan area.

The footing problem was made difficult by the natural sandiness of the soil, plus previous use of the site as a refuse dump. First tried as a means of sinking the proposed 30-in. diameter footing holes, was a 24-in. drill rig.

This unit proved ineffective due to the large chunks of concrete, metal scrap, etc., encountered. Next a crane was employed in an attempt to reach natural soil by excavating down 30 ft. or so. The refuse crumbled too easily, but this effort gave the contractors a better knowledge of the conditions, indicating that a drill large enough to gather up sizeable chunks of refuse could be used efficiently. A 30-in. drill was brought in and it proved to be effective in



Boring rigs on Los Angeles foundation job. 20 ft. booms mounted on Chevrolet 21/2-ton trucks.

making penetrations down to 35 ft. It was found that an "orange peel" could bring up the larger pieces and that the regular bucket do the rest.

When very large pieces were encountered a 30-in, steel ring or casing was used to shore up the walls of the hole, enabling a man to go down with an air hammer and break up the material.

The soil was found to be so loose in some areas that cave-ins in several holes have developed at various levels. In these cases a sandy clay soil, imported for the purpose, was tamped into the holes and employed as a binding arch to hold the fills in position until the drilling operation was completed and the pour made.

Speed on this job was a factor of such importance that once the correct procedures were learned for drilling and handling the soil, it became desirable to supply as much equipment to the job as practical for the size of the area. A total of 67 holes were sunk in a schedule of closely coordinated operations, using six drills working adjacently and simultaneously on the job. As each rig completed its drill of 30 or more feet, water was run into the hole and left to stand overnight. This soaking acted as a binder on the sand at the bottom.

The next morning the drills were sent down to bell out the sand bottom, and concrete was poured immediately from trucks whose arrivals was timed to coincide with the completion of each penetration.

### "Euc" loader to cut new ditches? Why not!

Heavy ditch reconstruction as part of a widening and modernization of U.S. 51 in southern Illinois, was performed recently by J. C. O'Connor Construction Company of Springfield, Illinois.

As shown in the accompanying pictures the job was in prairie type country and involved soft, easily handled soil. The old 20 ft. concrete pavement was being widened to 24 feet, and new shoulders and berms created as part of a complete modernization of this highway. The Euelid equipment was making a large daily footage along the project at the time these pictures were taken. The wagons travelled on the shoulder while loading and kept off of the pavement as much as possible, since this pavement was scheduled for resurfacing and avoidance of over-load was important.





 Euclid loader and Euclid wagons cutting new ditch lines on Illinois widening and modernization project.

### Auger drill mounted on half-track

Army half-tracks are still seen on quite a few road jobs. The one pictured here carries a 6-in. McCarthy auger powered by a gasoline engine mounted back of the driver's seat. It was used by H. W. Holt & Sons on Contract 24C on the West Virginia turnpike in recent months, where this firm had to drill extensively in shale for blasting.



 6-in. powered drill used by West Virginia turnpike contractor was mounted on army half-track to help negotiate rough ground.

### Soil-cement gets severe test in England

"After the breaking of the training walls of the River Thames during the floods in February 1953, some of the roads constructed of 6 in. soil-cement with one surface dressing carried for some months traffic estimated to be in the region of 20,000 tons a day, of vehicles carrying materials for the repair and strengthening of the river walls. On these roads there was no sign of any failure of the road foundation. The main damage caused by this heavy traffic was the shearing off in places of the surface dressing with a thin layer of the soil-cement.

These roads were built by mix-inplace methods similar to American

methods.

"Soil-Cement in an Urban Area," CONTRACTORS RECORD AND MUNICI-PAL ENGINEERING, Lennox House, Norfolk Street, London, W.C. 2, England, January 6, 1954.

### Articles on city planning

"Maintaining the Health of our Central Business Districts," by Larry Smith, Consultant on real estate development.

"Sociological Relationship of Traffic to Population and Distance," by Fred Charles Ikle, Research associate, Bureau of Applied Social Research, Columbia University.

"Pittsburgh's Redevelopment Plan," by Park H. Martin, Executive director, Allegheny Conference on Community Development.

"Seattle's Crosstown Parkway," by James D. Braman, Chief, Current Plans Section, City Planning Commission, Seattle, Wash.

"Decentralization of Retail Trade," by Samuel C. McMillan, Head of the department of marketing and Assistant Dean, School of Business Administration, University of Connecticut.

These five articles and others on correlated subjects are contained in the April issue of Traffic Quarterly. Each presents a well developed thesis and carries pertinent data. Mr. Ikle's paper is devoted to the development of general mathematical formulae for estimating traffic.

TRAFFIC QUARTERLY is published by The Eno Foundation, Saugatuck,

### Improved signs for Chicago expressways

Colors, sizes, and locations for Chicago expressway signs were studied and tested by State, County, and city, U. S. Bureau of Public Roads cooperating.

"The results of the tests showed that, of all the signs tested, the one with the white reflectorized background and black letters gave the lowest legibility readings. This was a significant factor in the ultimate choice of color combination using a dark background and white letters. Three types of reflectors produced satisfactory results, but the one containing moulded plastic buttons indicated superior legibility. Therefore, this type of material was used throughout the system excepting two interchanges on Edens Expressway in which the other two types of reflectors were used to permit continuing observations under actual traffic conditions."

Among important general rules adopted were: "(1) all messages will be limited to three lines of copy; (2) arrows will be placed on the sign at an angle approximately the angle the driver will follow, but in no case will an arrow be placed either horizontally or vertically (in such cases, a 1-in-7 slope shall be used); (3) the word 'EXIT' shall be used throughout the system instead of the word 'OUTLET;' and (4) all the signs which are being designed shall consist of a dark-green background with white letters.

"In the matter of letter size, the large signs in the interchange series were furnished with 12-inch letters, and in every case the message on the sign determined its overall dimensions. The community destinations on the signs at the ramp takeoffs are given in 8-inch letters to subordinate the community name to the more important part of the sign, namely, the name and direction of the crossroad, which is given in 12-inch letters. The information signs following the interchange are made up of 6-inch letters, while the bridge-name signs contain 8-inch letters.

"Erection details are: (1) edge clearance, desirable 10 feet, minimum 6 feet without curbs, 4½ feet with vertical curbs; (2) height, desirable minimum 4% feet to the bottom of the sign; and (3) angle of placement, approximately 85-deg. with the centerline of through pavement."

The paper refers to organizational planning involved and describes tests

and studies briefly.

"Expressway signs in the Chicago metropolitan area" by William F. Bauch, Jr. Assistant Traffic Engineer Illinois Division of Highways and John T. Nagel, Cook County Highway Department. Presented at the 33rd annual meeting, Highway Research Board, January, 1954, and published in full in HIGHWAY ABSTRACTS, 2101 Constitution Ave., Washington 25, D. C., May, 1954.

### **Bituminous mixture** density measurements

"For the past several years the laboratory of the National Crushed Stone Association has been investigating methods for the direct measurement of the percentage voids and maximum specific gravity of bituminous mixtures. The method that has been developed consists in evacuating the entrapped air from a sample of uncompacted mixture and then determining the volume and specific gravity of the voidless mixture by water displacement. The percentage voids of compacted samples from the same mixture can then be computed from the difference between the specific gravities of the compacted and uncompacted mixtures. The publication of detailed accounts of these investigations has generated interest in establishing a standard test method. The purpose of this article is to present the test method and to describe its advantages, limitations and applications.

"The vacuum-saturation technique for the direct measurement of the maximum specific gravity of bituminous mixtures is believed to be a realistic solution to problems that have long confronted asphalt paving technologists. The test has certain limitations as to types of mixtures that may be used, but further research may eliminate these restrictions. With proper samples, the method is rapid, accurate, and requires no equipment that is not usually available at testing laboratories or that cannot be easily

obtained. The method also eliminates the need for time-consuming specific gravity tests on constituents which are really not applicable, and should facilitate the study of mixtures where accurate information as to constituent materials is lacking. The test is now being used for the practical control of bituminous mixtures and it is anticipated that its use will be extended.

"New test method for direct measurement of maximum density of bituminous mixtures" by James M. Rice, CRUSHED STONE JOURNAL, September 1953. Above synopsis is from High-WAY RESEARCH ABSTRACTS, November, 1953.

### Improved densometer to test untreated materials

Washington State Highway Commission has advanced its control of untreated surfacing materials by an improved instrument and testing method. "Before adopting a density control specification for surfacing materials, we decided to first build an apparatus with which we could obtain rapid and accurate measurements of in-place density of all types of surfacing materials." Ten shortcomings are specified, at least one of which is found in every previously established method. The first is exces-

The new "Washington Densometer" is described, one page of pictures showing its design and another its operation. Its principle is the same as that of some other methods measurement of the fluid required to inflate a rubber balloon in the test hole - but a unique method of application greatly increases both speed and accuracy. The equipment is compact and can be carried by one man

comfortably.

In a series of test operations, "It was found that the apparatus exhibits a very definite stopping point when the piston is depressed; that an operator will repeat his determinations accurate to less than 0.0002 cu. ft.; and that two different operators can repeat each other's determinations with equal accuracy."

Check tests by the sand-volume method gave close comparative results. "The 'Densometer' consistently gave slightly larger hole volumes for the same hole, and the difference increased as the roughness of the hole surface increased. This indicates that the 'Densometer' more completely fills the voids than does the sand.'

"Method of Testing Density of Untreated Surfacing Materials" by Carl E. Minor, Materials and Research Engineer, and H. W. Humphres, Senior Materials Engineer, Washington State Highway Commission.

1953 Proceedings, Western Association of State Highway Officials. Thirty - second Annual Conference, October, 1953.

### Steam cleaner has many uses

"Considered on the basis of return per hour of use a steam cleaner probably pays off better than any other piece of maintenance equipment you can have on your construction job." This possibly over-strong statement by an un-named maintenance expert is followed by several pages of job data and explicit conclusions.

Among ways in which a cleaner can pay for itself the author lists:

(a) Reduces downtime by revealing worn or faulty parts in time to replace or repair before expensive breakdowns occur.

(b) Keeps operations going in win-

(c) Saves up to 40% of mechanics' time by eliminating grease wiping.

(d) Cuts painting costs. (e) Checks wear by removing abrasive, corrosive dirt, grease and road

(f) Increases efficiency of equipment and operators.

As odd jobs, hydrant thawing and heating concrete water are noted. A section is devoted to cleaner types

and sizes. Under "Cleaning Hints" are the following:

"(a) For quickly removing stubborn deposits of grease, road oils, tar, use high-pressure steam cleaning, 150-200 psi. and up to 325 deg. F. coil temperature.

(b) For removing common dirt, mud and clay, use high-pressure cold water to 400 psi. and 5 to 15 gpm.

(c) Where mud and dirt are impregnated with oil and grease or where there are light deposits of grease and oil, and also for quick deicing, use high pressure hot water to 400 psi. and 5 to 10 gpm.

(d) for hand-washing trucks and equipment, use low-pressure warm water, 3 to 15 gpm. at 120-200 deg.

(e) For degassing tanks, for heating asphalt tanks, for cleaning asphalt tanks, and for sterilizing purposes, use straight steam, 15 to 30 boiler-hp.

"Some operators pre-soak dirt and grease with a diesel - oil - emulsion spray. This loosens the dirt so it usually can be blasted off by high-pressure hot water alone. Thus, both chemical and time are saved. It is also easier on

"To strip paint down to the metal, most operators first spray or wash the painted surface with paint stripper. They wait a few minutes for the paint to peel up and wrinkle, then wash off with a hot solution from the steam cleaner."

"Effective use of Steam Cleaning on Construction Equipment" by Charles Mathewson, Vic Mathewson Co. Ltd., Toronto, Ont., ROADS AND ENGINEERING CONSTRUCTION, 341 Church St., Toronto 2, Ontario, April,

### Calcium chloride in concrete

The Calcium Chloride Institute presents a 40-page, illustrated bulletin on the uses, major effects, and approved methods of applying calcium chloride in concrete work. Though designed for popular, rather than technical reading, the bulletin gives considerable amounts of data largely in curves and diagrams.

Under the heading, "Major Effects," there are brief statements on initial and final set, early strength, ultimate strength, integral curing, workability and density, resistance to surface wear, cold weather protection, air-entrained concrete, and high early strength cement. Benefits are reported in all of these connections when calcium chloride is used in proper quantity. Much benefit is noted in accelerated curing; "At 70 F. the use of calcium chloride more than doubles the one day strength of concrete.

"It produces greater strength of approximately 50 percent at 3 days and 30 percent at 7 days." For the longer pull, tests are reported showing increases in ultimate strength from the use of calcium chloride amounting to 9% in 3 years, and from

6% to 11% in 5 years.

Workability is improved to the extent that water content can be reduced by as much as % gal. per bag of cement where denser concrete is desired. "Calcium chloride reacts the same with high early strength portland cement as it does with standard portland cement and the effects of its use are identical." Though maxi-mum temperature and total heat of hydration are not increased, calcium chloride causes the heat to develop and be released in about one-half normal time.

Specifications are given for calcium chloride (A.S.T.M. Designation: D 98), for the curing of concrete with integral calcium chloride, and for the curing of concrete pavements.

Calcium Chloride in Concrete, Manual CM-1, Calcium Chloride Institute, 909 Ring Building, Washington 6, D.C., 1954.

### Standard fits and tolerances

Fundamental principles and practical tabular data for the fitting of mechanical parts for either clearance or interference are presented in a

scholarly 10-page paper. The new "Unified Standards for Limits and Fits" is outlined and reference is made to other existing or predecessor standards - the Newall System (1902); British Sandard, BS 164 (1924). U. S. Temporary Standard, B4a (1925); International Standardizing Association's (ISA) Metric Standard (1941); and the American-British-Canadian Standards (1945-1953).

"This article explains some of the deficiencies found in the existing systems; the criteria adopted by the ABC conference for a unified system; and how the ABC agreements, based on these criteria, form the technical basis on which the American, British and Canadian Standards on Limits and Fits are being, or have been,

built.

Important definitions, basic data charts, and illustrative diagrams are

"Unified Standards for Limits and Fits" by Rowland Hill, Manufacturing Standards Engineer, Northern Electric Co., Ltd., Montreal, Quebec. THE Engineering Journal, 2050 Mansfield St., Montreal, Canada, May,

### Notes on preserving timber in salt water

A well known fact, still occasionally disregarded, is the danger inherent in boring, dapping, or cutting treated timber at points which will be below high tide level in a finished structure. In tropical waters where both limnoria and teredo thrive, destruction is almost certain; in other areas common. Example is cited in the case of piers built in 1943 in Guantanamo Bay, Cuba and posted as unsafe about 6 years later.

Mr. Mann's paper carries a substantial excerpt from "Design Factors Affecting Deterioration of Marine Structures," by Ralph C. Stokes, assistant head, Waterfront Structures Section, Bureau of Yards and Docks, Department of the Navy, Washington, D.C., presented before the "Marine Borer and Prevention of Deteri-oration in Waterfront Structures Conference" at Miami Beach, in 1952.

The general advantage of protection of piles and timbers by injected preservatives rather than by coatings or armor is noted.

Quotation is made from "An Interim Report, Navy Department, Marine Borer Investigations," by Rear Admiral Joseph F. Jelly, who at the time of the delivery of his paper (April 1953) was chief of the Bureau of Yards and Docks. The paper in its entirety was published in the AWPA Proceedings 1953.

It recommends maximum reduction of all exposures, and notes that while exposure of the shafts of supporting piles can not be avoided, all bracing members should be placed sufficiently high to preclude borer activity or

to reduce it greatly.

In referring to the elimination of under-water bracing, the great stiffening effect of a "composite deck" and the judicious use of batter piles are noted. Conventional and improv-

ed designs are shown.

Admiral Jelly is quoted, "Therefore, the logical solution in design is the location of the lower bracing at a minimum height of about 3.5 ft. above low water for structures at sites where the tide range is less than 6 ft. and at mid-tide elevation for larger tide ranges."

From the Stokes paper, "The fire hazard must not be overlooked in design. The principal protection consists in segregating a structure into several units by firewalls or bulkheads extending from the underside of the deck to a level below the low water line. The provision of openings in the deck for foam nozzles are often provided for additional protection."

"Design Details and Treated Piers" by Ralph H. Mann, Wood Preserv-ING NEWS, 111 West Washington St., Chicago 2, Illinois, April, 1954.

### Optimum base moisture proves its value

A too wet or too dry base mix may require twice the compactive effort of an optimum water-content mix. Demonstration is cited from a 5.1-mile job completed in 1953 between Norlina and Macon, North Carolina.

Aggregate was graded to specification in 6 sizes, with moisture content between 5% and 9% of laboratory dry weight, and machine-mixed after the addition of 7 lb. of calcium chloride per ton of material. Spreading was by machine in two 8-in. layers, each compacted to 6 in. with pneumatic tired rollers and a vibro tamper. Finished base thickness, 12 in. Flexible bituminous surface to be added.

Under previous specifications, the 12-in. base was made in four lifts of 4 in. loose material compacted to 3 in., only the top lift containing calcium chloride. Frequently it was necessary to add water at the job site to secure required density in the three lower lifts. Vibro tamper was not used, and three passes of pneumatic tired roller per inch of loose material were required — total, 48 passes.

On the Norlina-Macon job, the vibro tamper made a total of 6 passes for the entire 12-in. finished depth, and the rollers a total of 8 passes.

A 500-ft. comparative test section laid without calcium chloride required 33 percent more compactive effort to produce maximum density than did the standard stabilized section.

It is noted that the vibro tamper method eliminates the slippage planes frequently found in multiple layer construction.

Comment is made also on the difficulty of getting moisture back into a dense graded base which has dried too fast under spreading and rolling. Even a few passes compact the surface to a point where sprinkling does not penetrate.

"Present tests have shown that the addition of water on the job site may be eliminated, there is less segregation in material placed, design density may be obtained with less compactive effort, and there have been definite savings in maintenance until such time as the base is topped with a bituminous surface treatment."

"Base for Flexible Pavements Simplified by Moisture Control," NORTH CAROLINA ROADWAYS, North Carolina Highways and Public Works Department, Raleigh, N.C., March-April, 1954.

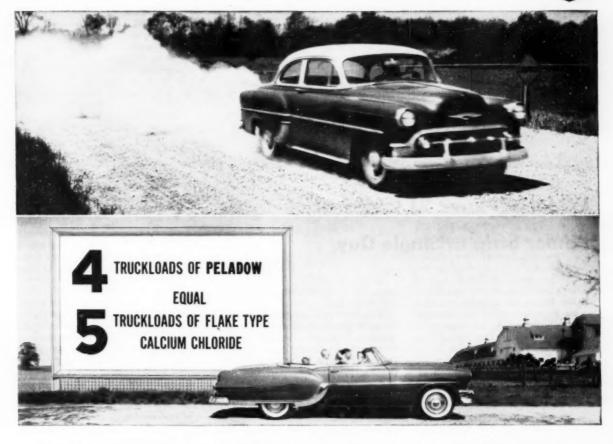
### Street lighting and night accidents

This British paper presents statistical comparisons of accidents (fatal, serious, and slight) in daylight and night-time driving, and points out certain common fallacies of interpretation of the data - particularly with reference to classes of persons injured (children, adults, pedestrians, motorists, etc.).

It makes a strong plea for more extensive and more intelligent lighting, but presents no mathematical conclusions or data on which such conclusions might be based.

"Street Lighting and Road Safety" by W. Robinson, Contract Record AND MUNICIPAL ENGINEERING, Lennox House, Norfolk St., London, W. C. 2, England, May 12, 1954.





# DUST-FREE ROADS ECONOMICALLY WITH PELADOW

Highly concentrated DOW calcium chloride saves work and expense by cutting the quantity required by 20%

Peladow<sup>®</sup> keeps dust down to give you safer roads with better visibility on which traffic can move at a brisker, steadier pace. But the benefits don't end there! Roadside houses and business properties are relieved of dust nuisance, too. Crops grow better and bring better prices when they are free of dust and dirt.

Peladow in the form of buckshot-size pellets, applied to dust areas, draw moisture out of the air, keeping the surface damp and firm. Roads can't "blow away" due to heavy traffic and hard winds. Less frequent gravel replacement is required; savings in material and labor costs are achieved.

Because Peladow is a highly concentrated (94-97%) form of calcium chloride, four truckloads of Peladow equal five truckloads of flake-type calcium chloride. This means savings in shipping, handling and storage as well as less material to apply. In addition to 100-lb. bags, Peladow can be shipped bulk in hopper cars. Get the complete story on how Peladow or Dowflake<sup>®</sup> (Dow's flake-type calcium chloride, 77-80%) will make your roads better, more economical to maintain.

Write THE DOW CHEMICAL COMPANY, Midland, Michigan, Dept. IN 993C1

you can depend on DOW CHEMICALS





## Widener Places 21,900 Feet of **Binder Strip in Single Day**

TWO new performance records for the laying of asphaltic concrete binder with the use of but a single machine have been set by a road-widening crew of Black Top Paving Co., Washington, Pa., in work done on Pennsylvania State Highway Route 31. The first was set when, in a 9-hour working day (May 18, 1954), some 440 tons of binder were laid in a 3-ft. width for a distance of 21,900 linear feet. The next day, a total of 583 tons of binder were laid in 3- to 6-ft. widths for a distance in excess of what was estimated to be the equivalent of 27,-500 linear feet.

The work was being done under a Pennsylvania State Highway contract which included the widening of a 16ft. reinforced concrete highway to 22ft. for a distance of 10.97 miles from the West Virginia-Pennsylvania line eastward through West Middleton Borough, and Independence, Hopewell and Canton Townships in Washington County. The existing pavement was to be widened on both sides with 3-ft. aggregate base (12-in. in depth)

• This Blaw-Knox Road widener set a day's work record for a single machine for its owner when it laid more than 27,500 linear feet of asphaltic concrete binder, in 3 to 6 ft. widths in a 9-hour working day.



and bituminous surface strips, 24-in.

Using the recently introduced Blaw-Knox Road Widener (formerly known as Apsco) Model 95, the nine-man road crew under Foreman John S. Eastham worked up and down hills and around curves in an operation that, for them, constituted what William B. Spencer, co-owner with W. D. Wiggins, Jr., of Black Top Paving Company, termed "a fine day's per-formance," on both of the working

"The crew was not out to set any records," Spencer said. "They had a good piece of equipment and they made good use of it. They were hampered the first of the two days by traffic interruptions and by people who stopped along the road to watch them." It was estimated by Foreman Eastham that the crew, making use of the widener, had done in two days, work that would have taken "at least a week to do with another machine.

"When the binder is placed," Eastham said, "we follow up with rollers which work along making three passes over the binder course, compacting the 1%-in. layer to 1%-in. The machine does a good clean job, squares off the outer edge with its strike-off gate, and when we are making curves where the application has to be gradually widened, the operator handles this while the machine is under forward motion without interruption."

When the two binder-laying records for the company were set, the company was "approximately 300 per cent ahead of schedule on the job," according to R. L. McPherson, Black Top's

purchasing agent.

We started our contract fairly early in February because we felt that we could take a chance on weather conditions and 'jump the gun' in getting started," McPherson said, adding, "We were fortunate in that we were correct in our action and we were able to ditch and cut out the roadside widths and depths in fast order, with the widener following the ditcher and laving the first course of aggregate. On this job both aggregate courses were laid to a depth of from 7% to 7% in., compacted, choked with screenings, wetted and allowed to cure for a couple of days. We did both sides of the entire stretch of highway, both ditching and laying the two aggregate courses in about 30 working days.

"Then we moved the widener from the job on Route 31 up to a spot on Route 18 in Beaver County (a distance of some 50 miles) where we handled a job of 2.67 miles, ditching and laying aggregate, the job taking a couple of weeks. Then it was moved back on the Route 31 job, where the

record was set."





 (Left): Tournapull gets pusher assist in loading damp sand mixed with clay. (Right): Tournatractor helps self-propelled scraper to pick up load on another section of Garden State Parkway job.

## Fast Scraper Work in "Pesky" Sand on Jersey Parkway

AMONG the fast yardage performances reported ances reported in recent months on the Garden State Parkway, that of Union Building and Construction Corporation, of Passaic, N. J., deserves more than passing notice. This firm had two C Turnapulls and a Tournatractor working in soft sand, on their 8-mile Section 7 job between Sayreville and Keyport. This 5-million-yard job includes a 150x2,000 ft. approach fill to the Raritan River bridge, and is broken up by numerous other structures.

Working on the bridge approach, Union's Tournapulls averaged a 7,-250-ft. cycle every 6.6 minutes. This time included 0.9 minutes to load and 0.2 minutes to spread. The rigs, assisted by a pusher in loading, averaged 13 pay yards of mostly damp sand mixed with some clay. Tournapull output per machine per 50minute hour varied from 91 to 104

pay yards (7 to 8 loads).

The Tournatractor handled scattered maintenance around the job, and in addition, did some push-loading, helped maintain haul roads, leveled the borrow pit and pulled sheep's foot roller. In handling emergency tasks, the Tournatractor traveled a mile in 3 to 4 minutes, its big low pressure tires taking it over pavement or tracks without planking.

### **Austin Road Company sets** Texas paving record

A new record for daily concrete production on work in Texas was set in March by the Austin Road Company of Dallas. This organization poured a total of 1026 batches with one paver in one operating day, on its U.S. Highway 75 project between Hutchins and Ferris.

This was a second record, the company having previously set a new high in February with 960 batches poured in 10 hours, 45 minutes. This earlier record was reported as being 97% of theoretical specification capacity, according to J. D. French, supervising paving engineer for the Texas Highway Department. The 960 batch day accounted for 1,966 lineal feet of concrete pavement 10 in. thick and 24 ft. wide, or a total of 5,242 sq. yd.

The paving outfit included a Koehring 34-E Twin Batch Paver, Jaeger finisher, Koehring transverse float finisher, and a special Flexplane joint machine for installing corrugated

metal joint strips.

This project is the longest ever constructed in Texas without expansion joints or any type of load transfer device, according to Mr. French. Instead of the usual Texas design which incorporates expansion and contraction joints, the slab is divided every 15 ft. longitudinally by thin corrugated metal divider forms permanently installed in the pavement.\*

J. T. Insall was general paving su-perintendent, and Sherman Thomas project superintendent.

The first experimental project using this type of joint is reported in article "Thin Corru-gated Rosd Joints Tried Experimentally in Texas," Roads and Streets, June, 1951.

 New strapping application devised by Superintendent H. P. Kunkler resulted in big savings.

### Strapping forms cut underpass column costs

Using steel strapping to bind 24-ft. concrete column forms has resulted in savings of 33% in labor and 48% in materials, H. P. Kunkler, general superintendent of Rieth-Riley Construction Company, Goshen, Indiana.

Kunkler said that he believed this was the first time that strapping replaced clamps on a 24-ft. column form. The method was employed by Rieth-Riley in construction of a clover leaf on Highways 30 and 33, near Fort Wayne, Indiana.

Columns on the Fort Wayne job were 24-ft. high x 2-ft. x 3-ft. A column of these dimensions consists of approximately 6 cu. yd. of concrete weighing about 24,030 lbs. The rate of pour on the job was 24 vertical feet per hour.

Kunkler found that 1% in. x .035 Bulkbinder strapping was adequate for this application. Using the clamp method, it takes about four hours to erect three columns of falsework, but with strapping, the same work was done in an hour. No special labor was needed for this new, time - saving method. An estimated \$4.90 was saved on labor per cubic yard of concrete, plus \$5.12 saved on lumber used in the same area; or a total of \$60.12 saved per column.







 (Left): Two 36-inch corrugated pipes that had served since 1916, but were washed out by peak flood. (Right): New pipe in place next day.

## **Quick Work at Culvert Washout**

A FLOOD washout report with a "happy ending" was the one that occurred on Little Salt Creek, near Nephi, Utah, on Highway U-11.

A pair of 36-in. corrugated iron culverts that had survived floods since 1916 went out with an exceptional flood flow. Acting with all speed, district engineer Robert R. Hickman of the Utah state road commission located a 56-ft. length of size B 7'9" span by 5'6" rise, 10-gage Armeo multi-plate pape arch that had been ordered for another location. An Armeo engineer was on the scene by 9 u.m. next day. The pipe was trucked to the site and a truck winch used to remove the old pipe while the plate pipe was being assembled. This

same truck was then used to ease the new pipe partly onto the stream and anchor it temporarily against the flood.

The big problem, that of backfilling, was done as follows: The streambed was cleaned up as well as possible and the pipe slid into final place on heavy timbers. The timbers were then removed and the structure allowed to settle into place. A load of straw was brought up, and a forkful at a time placed around the upstream end and held in place until it had silted up and would hold, this process finally being successful in forcing all the water through the pipe.

The downstream end was then sealed in the same way. A select

backfill material was placed under the haunches of the arch and tamped as well as possible. Backfill was then placed around and over the pipe and compacted. Traffic was resumed late in the same day, within 43 hours after the washout.

### Parking meter data

PARKING METERS: A STUDY OF THEIR NUMBER, REVENUE AND USE; Bulletin 81, by David R. Levin.

This report of parking-meter usage in the United States and Alaska is based on a comprehensive question-naire returned by 1,167 municipalities out of 2,803 places known to have parking meters. The project was a joint undertaking of the American Municipal Association, the Highway Research Board, and the Bureau of Public Roads.

Included are summaries made of detailed questionnaire information by population groups and states and covering such items as number and type of curb meters in use, proposed additional meters, location of meters with respect to use districts of city, reported attitudes of communities toward meters before and after installation, agencies responsible for administration of parking-meter programs, meter-purchase arrangements, reported revenues and estimated total annual take, disposition of gross revenues, average annual revenue per meter, rates of fines and other data.

Price \$1.35. Address the Highway Research Board, 2101 Constitution Ave., Washington 25, D.C.



• Multi-plate pipe-arch being assembled on roadway near site.

### N. Y. Thruway cost set at \$962 million

The New York Thruway has joined the list of turnpike projects which are turning out to cost more than the original estimate. This 427 mile system, now grown to 562 miles with connectors, is estimated to cost \$962 million to complete, instead of the \$500 million price tag given it at the start in obtaining approval of voters.

The new estimate was disclosed when Thruway chairman B. D. Tallamy recently invited bids on an additional \$300 million in revenue bonds.

Also announced at that time is the toll schedule for this longest-yet turn-pike, of which a 120-mile section upstate was opened to traffic with a dedication ceremony in June. Some of the toll details:

 New York state car registrants can buy a \$20 annual permit, good for indefinite use on the pike.

• A toll schedule base on 14 cents per mile is set for automobile trip use.

• Special tolls are established for several major bridges, including a 50-cent fee and monthly commutation ticket fee for the Hudson crossing at Nyack, and fixed fees at several turnstiles near Buffalo and the New York City area. The 427-mile trip from New York to Buffalo will cost \$5.60.

• In addition to 35 interchanges coming under toll tickets, there are to be 19 uncontrolled interchanges near the metropolitan terminals where motorists can come in and out without charge. Some of these were built as free-type cloverleaves under the early tax-financed stage of the project.

### Ohio turnpike contracts \$217 million to date

A total of \$217,596,998 in contracts for roadway and bridge construction is reported by the Ohio Turnpike Commission. Representing lettings in the period to July 7, 1954, this sum is only 2.7 per cent above the estimate contained in the Engineering Report of August, 1951. The increase is well within the commission's \$25 million contingency fund.

The last 4-mile section, around Elyria where right of way troubles caused delay, was expected to be awarded at this writing, and the entire cross-state turnpike opened to traffic October 1, 1955.

### Chicago gets ARBA 1957 road show

The 1957 American Road Builders' Association Convention and Road Show will be held in the International Amphitheater in Chicago. The



 Recently completed section of US. 99, chief north-south arterial highway in Washington state. This highway is being dualized in a concentrated program, involving access control.

dates, Jan. 28 through Feb. 2, 1957, have been announced jointly by Robert M. Reindollar, president of ARBA and Frederick Salditt, vice-president of the Harnischfeger Corporation, Milwaukee, and president of the Construction Industry Manufacturers Association (CIMA), an affiliate of ARBA.

The mammoth Road Show will absorb 300,000 sq. ft. of exhibit space, making it the largest indoor spectacle of its kind ever held. The latest in construction machinery and related equipment and materials will be displayed and demonstrated. The exhibition will bring in representatives from every State and many foreign Nations. This is the first Road Show since 1948 when a successful outdoor show was held at Soldier Field, also in Chicago, with 100,000 in attendance.

Preliminary plans for the huge exhibition were worked out at a recent joint meeting in Chicago of the ARBA and CIMA Road Show Committees, under the chairmenship, respectively, of Donald O. White, president of the American Asphalt Paving Company, Chicago, and Julien R. Steelman, president of The Koehring Company, Milwaukee.

## "Piggyback" rail-trailer service is approved

The Interstate Commerce Commission reversed itself on July 10 and gave the go-ahead to six eastern railroads on their proposed "piggyback" service of hauling highway trucktrailers cross-country on flat cars.

The Commission earlier had halted plans for such service. Meanwhile the railroads had filed a schedule of rates with ICC, in accordance with the law, and were ready to begin this new service immediately. The railroads involved are the Pennsylvania; Baltimore and Ohio; the Erie; D, L and W; New York, Chicago & St. Louis; and the Wabash.

Highway officials are watching the development because of its possible effect on traffic volumes and user tax revenues available for roadbuilding.

### Million dollars for Illinois turnpike studies

The Illinois toll road commission has contracted to spend more than a million dollars for advance engineering studies from the funds to be advanced by the state, subject to reimbursement when bonds are eventually sold. A legal opinion is being sought on the validity of this move.

The engineering is directed chiefly at route and feasibility studies for the various segments of turnpikes contemplated throughout Illinois.

Joseph K. Knoerle and Associates which made a preliminary study are engaged to make a \$663,000 investigation. Parsons, Brinkerhoff, Hall & MacDonald have a contract covering \$275,000 for potential traffic and toll revenue surveys for 465 miles of initial construction which will cost about \$583,000,000.

• Pennsylvania department of highways broke its own record for highway expenditures during the first balf of 1954, by reporting \$53,502,-000 for road construction, reconstruction, resurfacing and widening.



### RUSCIANO AND SON CORP. USES NEW REAR-DUMP TRAILER ON 400,000-YARD ROCK JOB.

As the New York Thruway rushes to completion, ton after ton of hard rock is being moved. Rusciano and Son Corp. has a contract to move 400,000 cubic yards of the rock on a section of the Thruway near Tarrytown. To move the rock, Rusciano is using three Athey PR21 Rear Dump Trailers — the new workmate of the Cat DW21 Tractor. The high-speed rigs are taking on their big profitmaking loads, hauling .8 of a mile at an average speed of 11 MPH, entering the dump area, manuevering and discharging their load in one minute, and returning at an average speed of 16 MPH.

The PR21s assure production, efficiency and economy for Rusciano and Son - and for you whenever you have rock or limited space problems. Ask your Athey-Caterpillar Dealer for information or write for a free copy of the PR21 Catalog.

### 3631 West 65th Street, Chicago 38, Illinois



The hopper tilts under positive hydraulic control to 60° to dump all the material. Wheelbase shortens in dumping position for additional maneuverability.



Tough steels, ruggedly reinforced, absorb the shock of falling rock. Low loading height and wide-top hopper enables shovel runners to keep swinging steadily.



### **Our Big Job**

(Continued from page 55)

"We have failed to educate the public," he said, "and the dangerous deficit is due largely to our own inadequate respect to sound public relations."

He called the public information activity the "most-neglected phase" of the highway problem and urged fellow highway officials to carry their programs beyond the legislatures to the great mass of citizens.

"Nobody has trouble with people if the people know the objective is honest and if they understand the facts in connection with it. If they do not understand or know all the facts, whose fault is it?"

Three steps are necessary in an information program, he pointed out:

- To determine objectives, in cooperation with good roads associations.
- 2. To familiarize everyone in the department with these goals.
- To work through the mass media to reach people — newspapers, radio programs, motion pictures, exhibits at county fairs, state teachers' meetings, brochures and speaking appointments.

Several states have gone far in programs designed to reach taxpayers and motorists. Maryland highway officials, for example, credit public relations activities as the lever in the successful adoption of a half-billion-dollar program in that state. They realized five years ago that the longrange program the state needed would require all possible civic support before it would become a reality. They knew, too, that the people of the state would not buy a "pig in a poke" but would have to learn the needs and the hard facts of financing.

The intensive public relations program which began in May 1949 produced items in the Maryland press totalling almost 16,000 column inches within the next six months — or the equivalent of 100 pages of newspaper space — devoted to the road program.

Guided tours for press and radio people, radio and television interviews with commission officials, motion pictures, speeches and special brochures throughout the next four years built up a reservoir of public understanding that paid off. When the department's \$568-million program came up before the legislature last year, it weathered a storm of controversy. Over 300 miles of new construction and 3,150 miles of improvements are scheduled for completion as a result.

In Idaho, a small public relations

### **Better Public Reports On Road Programs**

EDITOR'S NOTE: The annual Award for outstanding state highway program reports, inaugurated by the National Highway Users Conference at the recent Transportation Congress, is a major contribution to highway

First off, it is good to recognize a job well done on the part of highway officials. They receive all too little credit for the fine job which, in general, is being done throughout the country. And, as this project goes along from year to year, it will have a great stimulating effect in the improvement of program reporting practices. From the reaction to the first Award, it is clear that there has been a considerable stimulus of interest in what the other fellow is doing. We are certain to see new methods of presentation of data and wider distribution of reports as a result of this activity.

Roy E. Jorgensen, the NHUC's engineering counsel, in discussing the Award idea, offers the following comments and suggestions to Roads and Streets readers:

"The end result of highway program reports, is, of course, to inform the public through an informed public, to obtain support for the kind of highway programs we need. The project is bound to stimulate interest among the highway user groups as well as the public generally, with results which cannot help but be good.

"In New England, where the town governments are required by law to make annual reports, there has been a notable improvement in the character of such reports and the interest of the public in them due, in part, to the stimulus given by annual recognition within the states of particularly meritorious reports.

"The highway reporting situation is not too different and I am sure the result will be comparable.

"As a result of reports that have been made recently and of discussions with both technical and non-technical people, it appears that states may find it desirable to issue more than one report. There appears to be a need for a somewhat technical, comprehensive presentation of the highway situation. Such a report would in effect be an annual inventory with indication of progress in meeting highway needs and the accomplishments scheduled for the years ahead. This kind of a report would be of interest to the legislature and to organizations which have a very special and important interest in highway transportation. Supplementing such a report, there might be digests or summarizations prepared in popular form for wide distribution. In order to bring the situation into focus with the local interests of most of the people, the popular reports might be made to cover limited geographical areas."

staff makes a point of contacting personally as many as possible of the state's 81 weekly newspapers, 12 dailies, 24 radio stations and one television outlet. The residents are told who the contractor is, how long he has been in business, and what highway work he has done elsewhere. Confidence in the contractor is inspired before he begins to work on the job.

The state furnishes monthly feature stories for the newspapers, daily road condition reports for the radio stations and publicity on sufficiency rating studies, traffic comparisons and annual accomplishments.

Commissioner John A. Volpe, in Massachusetts, has a public relations director and staff which sends out an average of four press releases per day plus periodic reports. Groundbreaking ceremonies are televised frequently over the NBC station in Boston. District engineers and other of-

ficials make speaking engagements on invitation.

Referring to the brochure which won for his department a "Golden Milestone" award last month, Mr. Volpe asserts that such reports have been instrumental in the successful passage of the state's latest bond issue bill for road construction.

In Colorado, an experienced newspaper and radio man heads the information department. In addition to producing routine releases, the department writes special articles, builds displays, writes speeches for highway officials, and produces films.

• R. C. Perkins, state highway engineer, died on July 4 at age 69. He had been in poor health for over a year. Mr. Perkins was a leader in developing and maintaining a high level of engineering and administrative leadership in Western highway affairs.

# of the 6-wheel field



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Plant No. 1 crushing aggregates at mountainside pit. Triple reduction necessary to secure gradation.
 Blending of mountain-top material required to control P.I.

# HEAVY FLEXIBLE PAVEMENT BASE FOR Big Jets

Finding suitable and economic aggregates was a key problem in planning new heavy-duty paving at Abilene Air Force Base. This report discusses foundation aggregates, crushing methods, and subbase and base construction for flexible pavement under Texas Bitulithic Company's \$5 million job.

## Aggregate Production

Beginning 8-page special section. See also table of contents (p. 4) for other articles on aggregate problems.

MODERN airfield pavement construction is a problem of material "logistics." This fact is well demonstrated at Abilene (Texas) Air Force. Base, where materials of various quality and from various locations are being utilized to achieve an economic layered subbase and base design for heavy flexible pavement.

The job is at the site of wartime Tye airbase, where old lightly built runways are giving way to an entirely new 1954-model heavy-duty airstrip, complete with flanking taxiways and apron. Texas Bitulithic Company has

the work under a \$5 million grading and paving contract. A project of the Corps of Engineers, Fort Worth district, the current job comprises a 11,200x200 ft. runway, an 11,200x75 ft. parallel taxiway, connecting taxiways, and a 1,025x3,525 ft. apron.

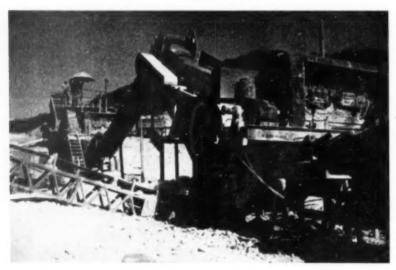
In accordance with Corps policy designs were prepared for all-concrete or all-bituminous or combination construction. The combination design accepted on low bid includes 1,000-ft. runway ends, main taxiway and apron of 16-in. uniform thickness concrete, supported on a 6-in. select base. The concrete pavement design and construction involving numerous noteworthy features will be described in a separate report.

The central 9,200x200 ft. of runway and the connecting taxiways totaling about 225,000 sq. yd. are to be asphaltic concrete. The chief interest in this pavement is centered in the problem of combining layers of various available aggregates, of differing qual-





Trailer-mounted Caterpillar D337 diesel supplying shaft power, which is variously hooked up to operate
the 3rd-reduction crusher, screen and two conveyors.



 Looking along the triple reduction Pioneer assembly; secondary unit in foreground, primary in background. (Below): Close-up of Universal plate feeder and primary jaw unit.



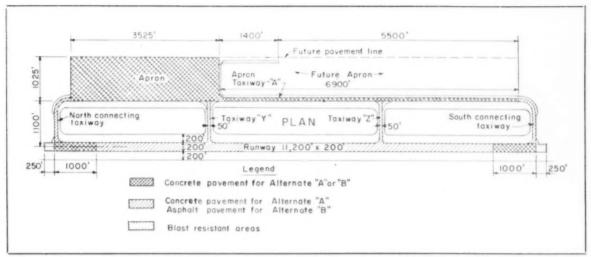
#### Plant No.1 on Abilene Project

(Scenes on this page and on previous page.)

ity, into subbase and base layers. About 330,000 cu. yd. of aggregates is required for all pavement base, 75,000 being select gravel for supporting part of the concrete apron, and most of the remaining yardage for the massive flexible base.

Soils investigations for paving design at Abilene Air Force Base revealed two distinct soils types. The apron, taxiway, and runway areas north of station 260+00 (about two-thirds of runway length) are underlaid by CH type silty clay, while the area to the south is underlaid by CL lean clays and sandy clays. Flexible pavement design north of station 260+00 was predicated on a subgrade CBR of 4 and south of 260+00 on a subgrade CBR of 6. Rigid pavement design for the entire field was based on modulus of subgrade reaction (K) of 100. A select material base course was placed between the subgrade and rigid pavement north of station 260+00, where the excessive amount of fines were encountered.

The thickness design for flexible pavement for very heavy jet bomber wheel loadings resulted in layered foundation systems ranging from 32 to 46 in. thick (see cross-section sketch, Fig. 2). The subbase specified as minus 15 P.I. material is 25 in. thick for the runway and 30 in. thick for the taxiway, these thicknesses being reduced to 16 in. south of station 260 where better subgrade occurs. The



• Figure 1. Layout of runway, taxiways and apron for initial Abilene project.

next 10-in. subbase lift is minus 12 P.I. material, and the 5-in. base of minus 6 P.I. aggregates.

Compaction requirements are specified by percentages of Modified AA-SHO density rather than specific roller passes. All fill, top 6-in. of subgrade beneath concrete pavement, and select material base beneath the concrete pavement are compacted to 90% Modified AASHO density. All base material for flexible pavement to a total depth of 20 in. below pavement surface is compacted to 100% Modified AASHO density. All remaining base material and the top 6 in. of subgrade is compacted to 95% Modified AASHO density.

The edges of the flexible base system, as noted in Fig. 2, slope 1:1 outward from a point beginning 12 in. out from the pavement edge, to assure proper edge support of wheel loads.

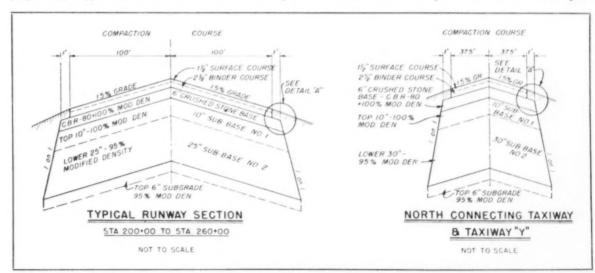
Another noteworthy point in design is the use of armored, blast-resistant shoulders and corner fillets along apron and taxiways and at runway ends. (See Fig. 4).

Detailed investigations were made of the aggregate situation within a 25mile radius of the airbase to locate sources of material for select material base, subbase and crushed stone base courses for rigid and flexible pavement construction. Every effort was made to utilize local aggregates. Geologists and materials engineers checked all known commercial sources in the area, then supplemented with drilling and sampling of new prospective areas. As a result of this study, select base material for use beneath the portland cement concrete pavement was located on the job site, caliche deposits for subbase material for asphaltic concrete flexible pavement construction

were located within 8 miles of the job site, and an excellent source of crushed stone base material was found within 8 miles. The crushed stone is obtained from the Cretaceous limestone cap rock on a series of hills south of the airbase. An 80+ CBR material is available from this source. At the foot of these hills caliche deposits containing sand, gravel, and limestone boulders derived from the overlying cap rock are erushed to produce a 50+. CBR material. Adjacent to these deposits a caliche deposit containing lesser amounts of sand and gravel is utilized to produce a 15+ CBR second subbase material.

The following is a discussion of the construction materials in general:

Sand and gravel were found in quantity along a creek within a 20-mile radius of the airbase. These are stream transported materials, and consist prin-



• Figure 2. Showing the heavier runway and taxiway cross-sections required for the poorer soil areas.



Caliche deposits containing sand

and gravel and others containing, in

addition to the sand and gravel, large

boulders from Cretaceous limestone

Spreading and compaction of runway base layers in progress.

Table 1 — Crushed Stone Base Gradation

Sieve Designation	Passin	g Squar	s by Weight e Mesh Sieves
	N	0. 1	No. 2
2 in.		100	_
1% in.	70 -	-100	100
I in.	55 -	- 85	70 - 100
% in.	50 -	- 85	60 - 90
% in.	40 -	- 70	45 - 75
No. 4	30 -		30 - 60
No. 10	20 -	- 50	20 - 50
No. 40	10	- 50	10 - 30
No. 200	5 -	- 15	5 - 15

Contractor has option of selecting either No. 1 or No. 2 gradation for production.

cipally of limestone gravel and siliceous sand. The creek deposits are in commercial production and will be used as portland cement concrete aggregate. These are deficient in the top sizes; i.e., 3"-1%"; therefore, a crushed limestone will be hauled from Brownwood, Texas, and blended to make up the deficiency.

• Two pairs of 50-ton rollers (these are Grace and Ferguson) were used to compact subbase and base layers.

are the materials found 8 miles south. The sand and gravel are stream trans-

Table 2 - Subbase Courses

Sieve Designation	Percentage by Weight Passing Square Mesh Sieve			
	Subbase No. 1	Subbase No. 2		
2 in.	100	100		
	50 — 80	50 - 90		
No. 4	30 — 60	30 - 65		
No. 40		20 - 50		
No. 200	5 - 15	10 - 30		
CBR	50+	15+		
Los Angeles rattler abrasion loss				
Not over 50% at				
500 revol.				
Liquid limit	30 max.	32 max.		
Plasticity index	3 — 12	3 - 15		

Material may be crushed or uncrushed gravel, crushed stone or slag, caliche, sand, soil, or other approved materials having similar characteristics.

> ported; the limestone boulders, talus, and the caliche a deposit formed by the evaporation of surface waters carrying calcium bicarbonate in solution which by evaporation leaves calcium carbonate precipitated in the interstices of the sand and gravel.

The Cretaceous limestone when crushed and graded to meet specification requirements for crushed limestone base course materials has a liguid limit range of from 17 to 20, plasticity index of 2 to 5, Los Angeles abrasion loss range from 36 to 41 percent, and magnesium sulfate soundness loss of from 20 to 50 percent. The material does not meet specification requirements for asphaltic or portland cement concrete pavement aggregates, but is an excellent base material.

Caliche deposits, when crushed and graded to meet specification requirements, have a liquid limit range of from 20 to 35 and plasticity index range of from 9 to 20. For better quality subbase course materials, the portions of the caliche pits with high percentage of limestone boulders were



utilized in order that Los Angeles rattler abrasion requirements can be met.

Quality, CBR, gradation, and Atterberg limits controlling these base materials for flexible type pavement are as shown in Tables 1 and 2. Base specifications also include:

CBR - 80%.

Los Angeles rattler abrasion loss not to exceed 50% after 500 revolutions.

Liquid limit — not more than 25.
Plasticity index — not more than 6.
The aggregate may consist of crushed stone or crushed gravel.

75% by weight of pieces retained on No. 4 sieve shall have two or more crusher fractured faces.

Requirements for the selected material base course for concrete pavement is shown in Table 3.

Table 3 - Concrete Base

Gradation Sieve Size	Percentage by Weight Passing Square Mesh Siev
2 in.	100
No. 4	50 - 75
No. 40	15 - 50
No. 200	0 - 15
Liquid limit	25 max.
Plasticity index	6 max.

Aggregate for concrete base shall consist of pit-run gravel, crushed stone, sand, or other approved materials having similar characteristics.

#### **Crushing Plants**

The crushing, delivery, placement and compaction of base material were subcontrated to Ernest Lloyd, of Fort Worth. This work involving 254,000 cu. vd. of crushed materials with an 8-mile haul is being produced in two plants. One plant owned by Frank Finley, and located at the foot of the mountain, produces aggregate from two sources of materials blended as necessary to control the P.I., using a Hough-International TD18 loader and trucks for rehandling. One source is the Cretaceous limestone, at the top of the mountain, which is loaded with a Lorain 1%-yd. shovel and hauled down to a stockpile. The other material, consisting of boulder strewn talus, is delivered directly to the crusher by heavy dumps.

This plant (crushing plant No. 1, pictured) is a triple reduction affair with rubber-tired units consisting of a Universal 30'x30" apron feeder, a 42x30 primary jaw crusher, 40x22 secondary roll, and 18x36 jaw (all Pioneer crushers). Three Caterpillar 337 diesel power units handled this entire assembly. One unit is hooked up to the third crusher, screen and two con-



 Tampo roller drawn by D8, making final compaction pass before next layer is spread.

veyors by belt, chain and shaft. (See photos.)

Plant No. 2, located at another mountainside pit, and subject to moves as necessary, consists of an apron feeder, 24x36 primary jaw crusher with Caterpillar D13000 engine and 22x40 roll crusher with 4x10 screen (and D13000), all crushers of Pioneer manufacture. A Northwest 80D shovel served this unit aided by an International TD18 dozer and Gardner-Denver 600 compressor for blast holes.

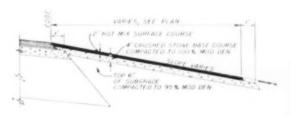
An efficiency feature of the shuttle trucks supplying both crushers is the use of special scoop-shaped aprons on the rear of the dump bodies, in lieu of the usual gates. This device enables truck to be loaded to near capacity with minimum spillage and dump faster into the feeder, and it saves time otherwise necessary in fooling with tailgates.

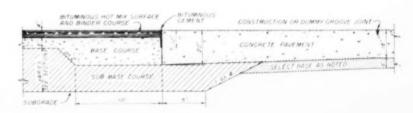
About 100 trucks and semi-trailers with various sized dump bodies have

been required over a period of many weeks for this operation; about 30 for pit-to-crusher hauling, water, or miscellaneous and 70 trucks for the 16 to 20 miles roundtrip delivery to the grade. Material delivery has been tightly scheduled and dispatched to keep the flow of aggregate well synchronized with spreading and rolling.

Rolling is specified to be done in lifts not exceeding 6 in. compacted thickness. Truck delivered windrow material is laid out with Caterpillar 12 motor graders. Rolling is done with 50-ton rubber tired compactors. Four such units have been used (Grace, Tampo and Ferguson), each drawn by a D7 or D8 Caterpillar. Each lift is required to be spread and compacted full width before beginning the next lift. The work has been done in sections about 2,500 ft. long to minimize turnarounds. Two or more 4,000gal. semi-trailer sprinkler trucks have been required for moisture control.

- Figure 4. How blast resistant areas adjacent to pavement are being armor coated.
- Figure 3. Detail of transition design at junction of rigid and flexible pavement.









TOP of mountain — Lorain shovel loading limestone. BOTTOM of mountain, Northwest 80D working
caliche pit. Materials from two sites blended as needed, to control the P.I.

#### Acknowledgments

The Abilene Air Force Base project is under the Corps of Engineers, Fort Worth District, headed until recently by Col. R. H. Hallock, district engineer, who was succeeded by Col. Harry O. Fischer. Lee Wilson is area engineer in charge. Dwight Morgan is project manager for the Texas Bitulithic Company, of Dallas, prime contractors.

# Aggregate bulk densities vary widely

From England again comes report of an interesting study in concrete materials, and the pointing out of possible substantial errors in proportions when mixes are designed in terms of weight and batched by volume, even when the aggregates comply with British standards. The study is based on measurements of the bulk density of aggregates both in the loose and the compacted condition.

"Laboratory tests have shown that variation of grading within the limits permitted by the British Standard 882:1944 for concrete aggregates results in differences of as much as 12 lb|cu. ft. in the compacted bulk density of coarse aggregates, and 13 lb|cu. ft. in Class A and 31 lb|cu. ft. in Class B fine aggregates. It was also found that the bulk densities of different gradings of a rounded aggregate were between 5 and 10 per cent higher than those of the corresponding gradings of an angular aggregate with the same specific gravity."

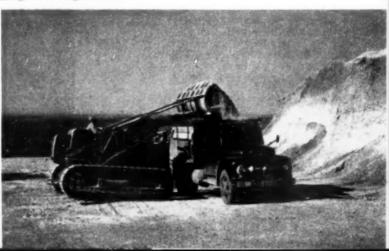
"The object of the present investigations was to show to what extent permissible gradings, within the limits specified by B.S.882,† and also particle shape, can affect the value of the bulk density. It is shown that it is not practical to devise a simple rule for assessing the bulk density of aggregate from available data, and that tests to measure the bulk density must be made on the aggregates to be used in each case."

The work described in this article was carried out as part of the programme of the Road Research Board of the Department of Scientific and Industrial Research. The test methods, all conforming to British standards, are described in part. Results are reported in a set of seven tables.

"The Effect of Grading and Shape on the Bulk Density of Concrete Aggregates" by D. S. Moncrieff, Magazine of Concrete Research, Cement and Concrete Association, 52 Grosvenor Gardens, London, S. W. I, England.

- Texas highway department has allocated \$31,488,000 for light maintenance and \$30,000,000 for heavy maintenance, widening, curve easement and grade lowering during the 1954-55 fiscal year. The state highway system comprises 46,322 miles of which 25,000 miles are farm-to-market routes. Light maintenance is averaging \$628 per mile, ranging from \$7,391 average for urban expressways to \$467 for farm-market roads.
- James E. Lambert, president of Lambert Construction Co., has been elected president of the New England Road Builders Association.
- (Left): Special scoop-shaped dumping pan replaces tailgate to speed dumping into feeder. (Right): Stockpiled blending material being reloaded by Hough for adding at crusher.





78



Hill gives way for curve easement — and in so doing yields big gravel tonnage. Whittaker and Gooding's Cedarapids Junior Tandem crusher being fed by Lima crane.

# Two Birds With One Stone (Pile)

Gravel hill which had to come out to ease a dangerous curve, produces 15,000 cu. yd. of granular base materials.

TWO birds were killed with one stone crushing operation, so to speak, when Washtenaw (Mich.) county engineer Howard Minier recently took out the roadside hill here pictured.

The hill had to be cut back in order to ease a very sharp and dangerous curve on state secondary highway M-92.

And in cutting it back, Minier turned the job into a pit crushing operation, to the tune of 15,000 cu. yd. of economically produced granular base material needed in the county's current road program.

M-92 is an example of how highways sometimes grow in importance. This route was a county road only a few years back. Today it carries the state M-92 designation, and its traffic serving the resorts, small communities and farms of the locality has increased to 800 or 1,000 vehicles daily. The road is black topped, and its alignment is generally quite satisfactory, the sharp curve in question

 Broken line shows position of slope stakes, all set for hill removal, as seen from north and south end of curve. being however an exception that has cost numerous accidents and several lives.

Having in mind the dual job of mining the gravel out of this glacial hill, and cutting the curve back,









• The contractor dumped crushed gravel on nearby township road. County truck did the spreading.



 Under-body blades are a familiar sight on maintenance and graveling trucks in Washtenaw County, Michigan.

Minier had taken an option from the land owner for the gravel at 10 cents a yard. This year, realizing that this option was soon to run out, he awarded a crushing and hauling contract, the job going to Whittaker and Gooding, contractors, of Ypsilanti. This firm, which produces around a million cubic yards of aggregates annually in southern Michigan, moved in with a Cedarapids Junior Tandem crushing plant, Lima crane and trucks and took the hill out in routine fashion. About 1,500 cu. yd. of material was spread by tailgate on nearby township roads, as part of a service of this kind which Washtenaw County performs at cost for townships where it fits in with the county's work schedule. Some gravel also was furnished to local village streets. The bulk of the production, exceeding 10,000 cu. yd., was stockpiled for county road graveling needs.

Following completion of the pit work, the county's forces were scheduled to grade and place base and surfacing for about a thousand feet of relocation around the curve. The new cut slopes are approximately indicated on the accompanying pictures.

The crushing job here is typical of that being carried on as routine throughout southern Michigan, which is blessed with an abundance of glacial gravel. This pit was heavily strewn with boulders and despite the grizzly it was necessary for the dragline operator to keep throwing big ones aside, and for a man to be kept at work almost full time picking larger stones off the belt to the primary crusher.

The plant's 10x24 jaw and 18x24 roll crusher then took the gravel down to %-in. maximum, under Michigan state specifications (22H) for base gravel. This pit is one of five or six locations that the mobile crushing unit is expected to work during the 1954 season.

In reporting this novel "two bird's" twist to an otherwise routine and common-place operation, it is worth noting that the job is part of an \$896,000 budgeted program of highway construction and maintenance for the year in Washtenaw County. The pro-

gram includes 10.3 miles of bituminous surfacing and 16.7 miles of gravel base construction. In turn the year's work is part of a carefully devised 8-year plan, complete with priorities arrived at with a combination of scientific "sufficiency rating" method and common sense.

County Engineer Minier is a national leader among county road officials in long-range highway planning, and he is justly proud of the fact that Washtenaw county's road system is ahead of most Michigan counties in adequacy rating.

#### PCA opens new offices

Opening of two new district offices, transfer of one district engineer and appointment of two new district engineers were announced by C. D. Franks, president of the Portland Cement Association, in Chicago recently. New offices are located at 227 N. Main St., Orlando, Florida, and at 611 Gravier St., New Orleans, Louisiana James E. Dunn, former manager of the Association's office in Washington, D.C., will be district engineer in charge of the Orlando office.

D. L. Chaney has been appointed the new manager in Washington, D. C., and Andrew J. Spradlin will take charge of Association activities in the New Orleans office.

- Traffic exceeded 100,000 vehicles in a single day on the 118-mile New Jersey Turnpike, this peak occuring during the recent Fourth-of-July week end when 351,200 vehicles used the pike in four days without a single fatal accident.
- The Pennsylvania Turnpike Commission is six years ahead of schedule in bond retirement, having retired \$25,602,000 in bonds since June 1951.

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# **Heavy Media Separation of Gravel**

Low specific gravity constituents in Indiana gravels are found to be correlated closely with lack of freeze-thaw durability of concrete pavements. A separation process is indicated as a means of producing better aggregates

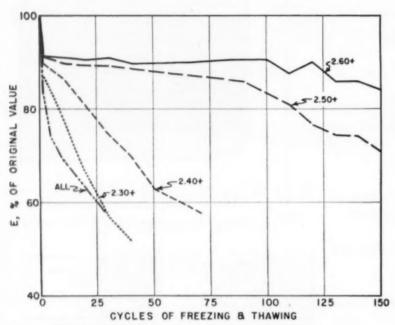


 Fig. 1. Durability of concrete made with individual specific gravity fractions of a gravel with poor field performance.

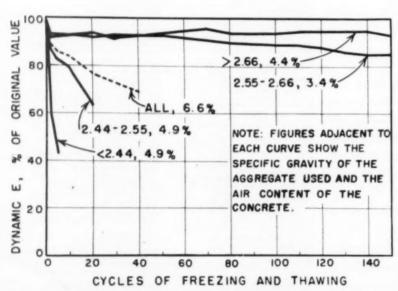


 Fig. 2. Durability of concrete made with poor gravel aggregate — particles lighter than specific gravities shown where removed by heavy media separation.

#### By D. W. Lewis

Research Engineer, Joint Highway Project, Purduc University

In recent years, several problems of concrete durability that involve the aggregates have been recognized. Of major importance in the Midwest is the problem of freezing and thawing durability of the concrete as affected by the coarse aggregate. An extensive field performance survey of more than 2600 miles of concrete pavement in Indiana was reported by Woods, Sweet, and Shelburne (1)°. This survey showed a highly significant statistical correlation of the source of coarse aggregate with durability; no such correlation with other factors was found.

Aggregate sources used in a little more than 10 percent of the total pavement mileage were classified as "significantly bad" and were found to be responsible for nearly half of all the deterioration noted. Both gravel and crushed stone aggregates were included in each performance classification. Since all of the aggregates had passed the standard acceptance tests, the need for research work on the problem was obvious.

The initial testing program was principally concerned with crushed stone aggregates, for which homogeneous samples could be obtained. The results of these laboratory studies have been reported in a number of published papers (2, 3, 4) and developed some highly significant correlations of field performance with laboratory test results. The nondurable aggregates were found to be characterized by high porosity, especially in the voids smaller than 0.005 mm. in diameter. These materials absorb water rather readily, and reach a degree of saturation (percentage of void space filled with water) of around 90 percent or higher. Deterioration of the concrete containing these aggregates is apparently caused by the action of alternate

Figures in parentheses indicate references listed in the bibliography,

TABLE 1. ABSORPTION, DEGREE OF SATURATION AND SEPARATION BY ROCK TYPES

Field Performance	Flotation Sp. Gr.	Percentage of	Absorption Under	Degree of		Percentage of Ma ecific Gravity Ra	
of Aggregate	Range	Sample	Vacuum, Percentage	Saturation, Percentage	Igneous and Metamorphic	Limestone and Dolomite	Sandstone, Cher and Shale
	< 2.44	7	8.3	97	1	29	70
GOOD	2.44-2.55	11	3.9	93	5	43	52
¥	2.55-2.66	33	1.8	78	36	52	12
	> 2.66	49	1.0	63	31	60	9
	< 2.44	15	8.5	97	2	14	84
POOR	2.44-2.55	14	3.4	91	11	24	65
	2.55-2.66	31	1.4	81	38	43	19
	> 2.66	40	1.0	66	32	62	6
	< 2.44	21	6.7	93	3		97
BAD	2.44-2.55	25	2.8	83	4	_	96
	2.55-2.66	43	0.9	62	54	-	46
	> 2.66	11	0.6	62	81	-	19

freezing and thawing when they are in a highly saturated condition, and can be duplicated by laboratory freezing and thawing tests on concrete in which the aggregates are used.

The gravel aggregates found in In-

diana are heterogeneous mixtures of many types of rock, some of which are durable while others are nondura-

# PETROLOGY OF LAMINATED LIMESTONES IN INDIANA By John B. Patton

Principal Geologist Geological Survey, Indiana Department of Conservation

A broad program of limestone research was initiated by the Geological Survey, Indiana Department of Conservation, in 1947. The laminated and banded limestones that occur at several places in the Indiana geologic column have been studied by the same analytical and petrographic methods applied to all the limestones that are exposed in the state, and several additional techniques have been applied to the study of the laminated beds.

Laminated limestone appears locally and thinly at many places in the Indiana stratigraphic column, but is particularly prevalent in the middle part of the Jeffersonville limestone (Devonian) in southeast-central Indiana, the Kokomo limestone (Silurian?) in north-central Indiana, and the St. Louis limestone (Mississippian) in south-central Indiana. The laminated beds in the Jeffersonville and Kokomo limestones have been reported by engineering organizations to have poor performance records where used as concrete aggregate. If the same is true of the laminated beds in the St. Louis, the fact has not been called to the attention of the Geological Survey.

Comparisons have been made between the laminated beds of the Jeffersonville and Kokomo limestone beds of approximately the same chemical character to determine what physical or mineralogic factors may account for the difference in performance records. The methods used in the investigation were microscopic study of thin sections, polished sections, and peels; chemical staining; and microscopic examination and X-ray diffraction analysis of insoluble residues.

The laminated beds of the Kokomo and Jeffersonville limestones are dolomitic (30 to 35 percent MgCO3), but this factor alone cannot explain unsatisfactory preformance, as both dolomitic limestones and dolomites furnish good aggregates in many localities. The silica content of the laminated limestones is, in general, higher that that of the non-laminated limestones that were studied for purposes of comparison. However, the mere presence of silica is not, in itself, deterimental to aggregates, as both silica and sandy limestones have been widely used. The alumina content of some of the samples studied was also higher than that of the nonlaminated limestones, but not so high as to suggest that argillaceous material was the cause of the difficulty. Iron content also was high in some of the laminated limestones. However, both alumina and iron were lower in some of the laminated samples than in most of the non-laminated samples.

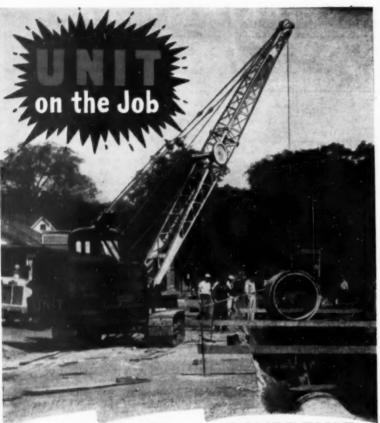
A solution of malachite green in nitrobenzene was used to stain polished surfaces and thin sections. The stain penetrated more deeply in more porous laminae and thus revealed lamination that was obscure without staining. Methylene blue also stained the samples differentially.

The insoluble residues from the laminated limestones consisted mostly of fine-grained quartz. X-ray diffraction a n a l y s i s revealed that small amounts of illite were present in both the laminated and non-laminated limestones, and traces of kaolinite were present in some of the limestones of each type.

The most conspicuous lithologic features of the laminated limestones was the presence of fine-grained pyrite in the darker laminae. Some of the samples no longer contained pyrite crystals, but their cubic outlines were evident as cavities that contributed to the porosity.

Pyrite is considered detrimental to concrete aggregates, but the unsatisfactory performance apparently extends both to the lamiated limestones which still contain concentrations of pyrite in the darker laminae and to those from which the pyrite has been leached. For this reason, and because the other physical and mineralogic characteristics of the laminated limestone are practically identical to those exhibited by the non-laminated beds, when used as concrete aggregate, is due to the differential porosity of the lighter and darker beds and to the consequent selective absorption and the oriented direction of stress caused by freezing and thawing.

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ble. The tests for degree of saturation and pore size could not be applied to the gravels, since the average results for such mixtures of materials had no value. Nondurable or deleterious particles may cause only surface popouts if the number of them is relatively small; if sufficiently numerous, general deterioration of the concrete may result. An extensive series of laboratory tests has been conducted in recent years to determine the nature of the deleterious materials and to find a means of separating them from the durable particles. Gravel in the size range from No. 4 to 1-in. was used for all tests.

#### **Heavy Media Separation**

Since the deleterious constituents were thought to be highly porous and therefore low in specific gravity, separation of the gravels by flotation in heavy liquids was used. Carbon tetrachloride (sp. gr. 1.58) and acetylene tetrabromide (sp. gr. 2.97) were mixed together to form liquids of the desired specific gravities. The aggregate was soaked in water for 24 hours to prevent absorption of the heavy liquids, then surface dried and placed in the liquid.

Particles of gravel that sank had a higher specific gravity than that of the liquid, those that floated were lighter. By using a series of liquids of different specific gravities, the gravel particles can be divided into specific gravity ranges or groups by determining between which two heavy liquids their specific gravity lies.

#### **Test Series Conducted**

Two series of tests were conducted. In the first, gravels from several sources were separated into the specific gravity ranges less than 2.44, 2.44 to 2.55, 2.55 to 2.66. and over 2.66 by the use of heavy liquids. Each of the specific gravity fractions was then classified by rock type, subjected to absorption and degree of saturation tests, and used as aggregate in con-

(Continued on page 88)

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#### **Heavy Media Separation**

(Continued from page 86)

crete specimens for freezing and thawing tests. Aggregates ranging from good to bad in field performance were

In the second test series only one gravel with a poor field performance record was used. Five samples were tested in concrete subjected to freezing and thawing. In one of these the gravel was used as received, in the other four all material lighter than a given specific gravity value was removed by heavy media separation. Specific gravity values used in the four samples were 2.30, 2.40, 2.50 and 2.60, respectively.

#### **Test Results**

#### Absorption, Degree of Saturation and Rock Types

Typical results of the separation by rock types and the absorption and degree of saturation tests conducted in Series 1 are shown in Table 1 for three of the gravels tested. Although the field performance ratings vary from good to bad, the trends in the data are the same for all three. As the specific gravity of the particles increases, both the absorption and degree of saturation decrease with marked differences between the different specific

Similar trends are shown in the composition, the lighter materials being composed principally of sandstones, cherts and shales with these materials decreasing in abundance as the specific gravity increases. There appears to be a rather definite break at the specific gravity 2.55, with a drastic change in the percentage of these materials above and below this value.

An excellent correlation is shown between the field performance and the percentage of the aggregate in the low specific gravity ranges. The best aggregate has only 18 percent of the total material below 2.55 in specific gravity, the poor aggregate 29 percent, and the one with bad field performance has 46 percent lighter than

#### Freezing and Thawing Tasta

The freezing and thawing tests were conducted on 3 x 4 x 16 in, beams of air entrained concrete. Freezing was in air at -15 to -20° F., thawing in running tap water at 55 to 60° F. One cycle per day was run, with the deterioration checked by dynamic modulus of elasticity tests (ASTM Designation C-215)

The results of all freezing and thawing tests conducted in Series 1 were quite similar; therefore, the results for only one gravel are shown here. Fig. 1 shows graphically the test results for an aggregate with an intermediate (poor) performance record. The dynamic modulus of elasticity, as a percentage of the original value, is plotted against the number of cycles of freezing and thawing. Relative durability is indicated by the rate of change in the E value; the more rapid the decrease in E, the poorer the durability. Each curve is the average for three specimens.

It can readily be seen that the durability varied directly with the specific gravity of the aggregate. The higher specific gravity particles produced durable concrete, while the concrete made with the fractions under 2.55 in specific gravity had very poor durability. The mixture of all specific gravities (gravel as received) showed in-

termediate durability

The relationship of specific gravity to durability shown in this figure was found to exist for all gravels tested, regardless of source and service record. The lowest specific gravity fractions had very poor durability in every case.

In the second series of tests, the same gravel shown in Fig. 1 was used, but with the heavy media separation made on a different basis. Instead of separating the gravel into narrow specific gravity ranges, each



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sample was treated at one value and all material lighter than that specific gravity was discarded. The results of the freezing and thawing tests on concrete made with the gravel fractions heavier than each separation value are shown in Fig. 2.

The poorest durability was shown by the untreated gravel (curve marked "All"). Separation at the 2.30 specific gravity improved the durability slightly, while separation at 2.40 improved it significantly. Gravel treated at the two higher separation levels, 2.50 and 2.60, produced excellent concrete durability. The percentages of the total gravel removed at 2.40 and 2.50 were approximately 10 and 20 percent, respectively.

#### **Heavy Media Separation**

Commercial heavy media separa-tion processes have been used for many years in concentration of ores. These techniques can be used to remove lightweight particles from gravels in the same manner as was done in the second series of tests described above, the results of which are illustrated in Fig. 2. Such a process, using a suspension of finely divided magnetite in water as the heavy liquid, was successfully used in Canada to remove shale from a gravel aggregate (5). Plants of this type are currently reported to be in use for gravel treatment in Pennsylvania, Minnesota and Michigan.

The results of the tests indicate that such treatment could greatly improve the durability characteristics of some of Indiana's gravels. The amount of improvement is directly dependent upon the specific gravity at which the separation is made. To whatever extent the process could be economically applied, it would offer a possible means for improving the aggregate quality.

#### Conclusions

Based upon the test results obtained to date, the following conclusions

1. The deleterious constituents of the gravels are principally sandstones and cherts with lesser amounts of shale and badly weathered rock of other types.

2. These nondurable particles are characterized by low specific gravity, high absorption and degree of saturation and poor durability in concrete subjected to freezing and thawing.

3. The deleterious particles can be removed by heavy media separation processes, indicating that commercial methods might be used to produce better aggregates.

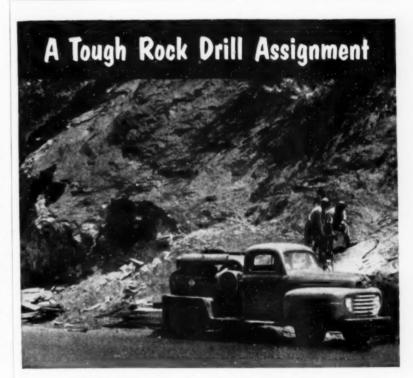
4. The results indicate a possibility that specification limits on deleterious particles in gravels might be set as a maximum percentage lighter than a given specific gravity value. Additional work is underway to investigate this possible application.

#### BIBLIOGRAPHY

- K. B. Woods, H. S. Sweet and T. E. Shel-burne, "Pavement Blowups Correlated with Source of Coarse Aggregate," Proceedings, Highway Research Board, Vol. 25, pp. 147-
- H. S. Sweet, "Research on Concrete Durability as Affected by Coarse Aggregate," Proceedings, American Society for Testing Materials, Vol. 48, pp. 988-1019 (1948).
   D. W. Lewis and K. B. Woods, "Research as Related to the Development of Aggregate Specifications," Proceedings, 37th Annual

- Purdue Road School, Extension Series No. 69, Vol. 33, No. 5, pp. 155-173 (September,
- D. W. Lewis, "Research on Concrete Aggregates," Proceedings, 36th Annual Purdue Road School, Extension Series No. 71, Vol. 34, No. 3, pp. 87-100 (May, 1950).
- C. V. Trites and J. D. Shannon, "Acceptable Aggregates from Low-Grade Deposits," Rock Products, Vol. 53, February, 1950.

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# Court decisions that affect your job

#### By Albert Woodruff Gray

#### Material contract void

A letter to a California County Road Commissioner from a stone and gravel company, said, "It is our proposal to deliver % inch crush run material at the price of \$1.00 a ton of 2,000 pounds." To this the Commissioner replied, "This is your confirmation to go ahead making your preparation for crushing this rock."

In the suit brought later by the gravel company for a breach of the contract contained in these two letters, for failure to accept delivery of this road material, the California court said in its decision against the gravel company.

"The Road Commissioner was without power to negotiate such a sale. One who deals with a public officer stands charged presumptively with full knowledge of the officer's powers and is bound at his peril to ascertain the extent of his power to bind the government of which he is an officer."

Bear River Sand & Gravel Co. v. Placer Co., 258 P. 2d 543, Cal.

#### Alteration of water course

Private property in Wichita, Kansas, was flooded in consequence of the development of a drainage area under the directions of city officers. The suit for damages brought by the owner of this land against the city was unsuccessful.

"Adequate drainage," said the court, "was a necessity for the protection of the public health and welfare. Proper grading, curbing and drainage of streets are incidents to the construction and maintenance of streets, and a governmental function.

"The building of additional flumes for handling the flow of surface water served the same or similar purpose to that of additional storm sewers. The authorized alterations in the water course constitutes an integral part of an adequate drainage system and the acts of the city were performed in the exercise of governmental functions."

Perry v. City of Wichita, 255 Pac. 2d 667, Kansas

#### **Meetings Ahead**

Public Works Congress—and equipment show — American Public Works Association, Municipal Auditorium, Atlantic City; September 19-22.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.—Mid-Year Board Meeting, Chase Hotel and Park Plaza Hotel, St. Louis, Mo.; September 27-29.

SOUTHEASTERN ASSOCIATION OF STATE HICHWAY OFFICIALS — annual meeting, Hermitage Hotel, Nashville, Tenn.; September 28-30.

CAROLINAS BRANCH, ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC. — Annual Convention, The Greenbrier, White Sulphur Springs, West Virginia; November 14-16.

VIRGINIA ROAD BUILDERS ASSOCIA-TION—Eleventh Annual Meeting, Hotel Roanoke, Va.; November 18-19.

New York State Bituminous Concrete Producers Association. Tenth annual convention, Hotel Statler, Buffalo, New York, November 29.

ILLINOIS ROAD BUILDERS ASSOCIATION Annual Fall Meeting and Dinner, Palmer House, Chicago; December 1-2, 1954.

ASSOCIATION OF ASPHALT PAVING TECHNOLOGISTS — annual meeting, Jung Hotel, New Orleans, La.; February 7-9, 1955.

Georgia Highway Conference — Sponsored by Georgia Highway Department and Civil Engineering Department, Georgia Institute of Technology, Atlanta, Georgia; February 7-9, 1955.

#### **Publications Received**

"Mechanics of Materials — 3rd Edition." By Philip G. Laurson and Wm. J. Cox. Published by John Wiley and Sons, Inc., 440 Fourth Ave., New York 16

The publisher says that this is "A well-rounded survey emphasizing the physical behavior of stressed bodies, relating theory to practice, and proceeding step by step from the simpler





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In the publisher's words, "How to write contracts and specifications — your up-to-date guide in the administration of construction work." Seventeen chapters and 429 pages.

#### Equipment men briefed on federal bureau's role

In a precedent-breaking conference, Commissioner du Pont of the Bureau of Public Roads received on June 8, 1954, a group of Washington representatives of the equipment manufacturing industry and briefed them on the activities of the Bureau. Top officials of the Bureau presented 15-minute talks and participated in 5-minute discussion periods of the Bureau's-work with the industry representatives.

C. D. Curtiss, head of the Finance and Management Division, called the attention of the equipment industry to its very essential role as a member of the highway-building team and to the fact that the conversion of highway blueprints into highways really starts at the equipment factory where labor hours are transformed into the tools of highway production.

M. B. Christensen, Assistant Deputy Commissioner for Construction, pointed out that highway construction and maintenance, while a big business, is also small business in the sense that there are at least 6,000 contractors utilizing road equipment in the production of highways. He also pointed out that the equipment industry was playing no small part in the stretching of the highway dollar. Through charts, he illustrated how the cost of road excavation has been kept down to a fraction of what it would have been if it weren't for the ingenuity of road equipment manufacturers.

Joseph Barnett, Assistant Deputy Commissioner for Road Design, emphasized the major contribution of the road equipment industry to design. Because of the lower earthmoving costs brought about by improved equipment, the highway designer is able to increase the sight distance and widen the highways for better visability and safety, and because of better machinery, to build wider and more durable pavements for the available dollar.

H. A. Radzikowski, Assistant Deputy Commissioner, summed up the interest of the equipment manufacturer in the highway program by pointing out that 23 cents out of each highway construction and maintenance dollar goes into equipment services of which 11 cents are for new equipment purchases. On the 1954 program of about \$5.5 billion, equipment services amount to about \$1.3 billion and the new equipment market to \$600 million. He also pointed out the possible future equipment market by calling to the attention of the group the \$35 billion estimate by the American Association of State Highway Officials of deficiencies on the Federal-aid highway system.

F. C. Turner, Assistant to the Commissioner, explained to the group the part that the Bureau has played in the development of the foreign equipment market. He said that the primary purpose of such work was to assist the foreign governments in setting up mechanized organizations that would be able to carry on their own work to do that as quickly as

possible.

E. H. Holmes, speaking for the Deputy Commissioner for Research, outlined the highway research program of the Bureau. S. K. Booth, Assistant Solicitor, explained the new provisions incorporated in the Federal Aid Highway Act of 1954. R. A. Dane, Assistant Chief of the Equipment Procurement and Traffic Branch, spoke on the procurement policies and procedures.

C. R. Henry of The Oliver Corporation, spokesman for the Washington representatives of the equipment industry, thanked Mr. du Pont in behalf of the group. He pointed out that the equipment industry was most appreciative of being invited into the home of the Bureau for the briefiag period. He noted that this was a step forward in the development of in-

dustrial relations.

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the nation that does not permit welding of structural steel on any highway bridge except by electric welding operators who have been qualified for this type of work.

To carry out this program the state highway commission has employed James Warn, an experienced welder, as chief welding inspector. As inspector, Warn supervises the qualifying of welders and conducts shop and field inspections. Also, as a part of the program the commission, through the co-operation of the Kansas City Structural Steel Co., conducted a welding school for division welding inspectors whose job it is to supervise all welding work in the respective di-

visions. It was the first school of its kind for welders employed by the commission.

The qualifying of welders is conducted in accordance with standard practice of the commission which conforms in general to, but departs somewhat in details and methods of examination, the provisions of the American Welding Specifications.

The welder may qualify with either a direct or alternated current machine or with both types. If he chooses to become qualified with only one type of machine, he is permitted to use only that type when welding on state highway projects. When taking his tests for qualification, the welder is required to use an electrode suitable for the positions and conditions of intended use and chosen from American Welding Society and American Society of Testing Materials classifications.

An operator wishing to become qualified makes application to the materials department. He is furnished with complete instructions and specifications and is required to prepare a set of standard test specimens in his or his employer's shop without attendance by highway representatives. These specimens are sent to the highway commission for testing. Should any of the specimens fail to conform to the requirements, the test must be

repeated. Should the second attempt also fail, further testing is withheld for at least ninety days. After successfully passing the preliminary or "shop supervised test" the operator is required to complete identical test specimens while supervised by a representative from the Commission. The operator is qualified in the class for which he has successfully completed the commission supervised test.

A qualified operator who does not weld on state highway work for a period of one year or longer may be required to repeat the qualification test. An operator may be suspended for apparent defects such as poor workmanship, bad appearance of the weld, undercutting, slugging or any other injurious procedure.

This prequalification requirement for welders is in keeping with the commission's plan of requiring contractors to be registered and qualified to perform highway work.

 Traffic on the 115-mile upstate section of the New York Thruway opened in June surpassed expectations during the first week, according to the turnpike authority.
 Trip tickets were sold to 63,977 vehicles for \$34,661 involving 2,500,000 miles of travel.



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#### VIEWS AND COMMENTS

## Needed—A "Sense of Proportion" on Aggregate Specifications

By H. G. Nevitt

Within the writer's memory it has been almost axiomatic that bituminous mats were best built with crushed or irregularly shaped materials. A common specification today is that some proportion of the aggregate must be crushed. The initial low cost paving programs of some plains states were viewed with doubt because their aggregates were predomi-nantly smooth and rounded, and often too small to crush. Though admittedly success was attended by with difficulties at the start, the ultimate success of such construction has not received the attention it deserves. Most engineers still emphasize that evasive characteristic, high stability, and the sometimes costly aggregate that may go with it.

Unquestionably it is easier to build good looking roads with costlier crushed materials. And their use can provide many benefits. This is there-fore not an argument that such aggregates should not be used, but rather that they should be used wisely, and when expensive in such fashion as to produce the most benefit from their desirable characteristics. Too often the main reason behind the employment of crushed aggregates seems to have been that it was easier - particularly without engineering knowledge and skill - to get good jobs (at least initially) with them.

#### Idea Still "Heresy"

To many, the above statements are still heresy. For the idea that crushing is essential to good work is firmly entrenched. It is only in recent years that observant and analytically minded engineers have begun to question this viewpoint. Yet questioning it, as has been done in these writings in the past, has been of little avail. But the facts are beginning to come out, and these practical observations have been given strong support by a recent study made at Purdue under the joint road research program of the State Highway Department and the University.

This analysis, well planned and effectually backed up by consistent data, indicates that the optimum design (including stability) is dependent upon three factors — the aggregate gradation, its surface roughness, and its predominant particle shape. Of these the gradation is by far the most influential. With the best gradation the other factors, particularly the shape, are of little importance: with a poor gradation they have more effect, but at the best can hardly overcome serious gradation defects.

The data may be summed up by some such statement as the following. Particle shape, and to a much greater extent surface texture, may greatly improve designs which lack good gradation; but their lack can be almost entirely overcome by careful gradation control. And the economic corollary would seem to be that the first place to spend money to get improved structural strength is in bettering the gradation, with expenditures for surface texture, and particularly for irregular shape as through crushing, mainly justifiable only from other benefits where such are clearly needed or obtainable. Since these conclusions are so far reaching we refer the reader to this important study, so that he may (we hope) be even more emphatically impressed by drawing his own conclusions.

We need some characteristics in bituminous mats which can best be obtained by crushed or irregular aggregates if properly used - though too often this latter is not the case. But we also badly need economy, both to get more roads from the limited funds and to hold down maintenance costs. The judicious use of expensive materials is therefore indicated likewise careful scrutiny of specifications which unnecessarily run up costs. With such careful use of premium materials the total consumption of such materials may increase, because this will make possible the building of more road mileage from the available funds.

# Reinforced asphalt resurface for turnpike

A contract for resurfacing 22 miles of the Pennsylvania Turnpike with asphaltic concrete reinforced by steel welded wire fabric has been let by the turnpike commission. The resurfacing project, largest yet involving the fabric-in-asphalt process, is located near Somerset and covers all four lanes of the pioneer super-highway between Laurel Hill Tunnel and Allegheny Tunnel. Latrobe Construction Co. of Latrobe, Pa., was awarded the contract at \$1,045,106.20.

Resurfacing of an entire 24 foot lane width at one time will be accomplished by operating two pavers in tandem, while traffic is diverted around the work in progress to the opposite dual lane.

Specifications call for an initial leveling course of bituminous mix on the exisiting pavement, to bring it up to level where necessary; then welded wire fabric (10-ga. wires spaced 3 by 6 in. in sheets 11½ by 7 to 8 ft.) will be placed directly on the existing concrete pavement or the leveling coat, followed by 2 in. of binder asphaltic concrete and topped by a 1-in. wearing surface. Completion date is October 15.

The asphaltic concrete resurfacing, in which welded wire fabric was specified for added durability, crack prevention, and "ripple" control, covers a portion of the original pike pavement completed and opened to traffic in 1940, which was built without a prepared sub-grade or foundation and improved draining methods. Despite the exceptionally heavy traffic over the years, plus the unanticipated overloading of the war years which came almost coincidentally with the opening of the original Pennsylvania Turnpike, the 9-in. reinforced portland cement concrete pavement held up exceedingly well, without deterioration, according to turnpike spokesmen. Only recently has resurfacing become advisable on this portion of the 160 mile original section.

(The extensions of the Pennsylvania Turnpike and turnpikes in most other states have been and are being built with a minimum of 10-in, of reinforced portland cement concrete pavement and 6-in, of prepared foundation material.)

#### Kansas have most projects?

Kansas is said to be leading the nation in mileage of work being built, programmed or approved under the federal - aid program. The mileage for the calendar year 1954 will be 2,018 miles, costing an estimated \$33,187,000.

# Flexible Type Pavements

By C. N. Conner

Highway Engineering-Consultant, Washington, D.C.

A survey of thickness design practice among the states shows a great variety of methods, but considerable progress since the war in development of adequate roadbeds. The chief need today is a rational design for the normal or average of conditions, correlated with test road data.

THE North Atlantic States must be given full credit for initiating and early developing substantially all types of flexible pavements. This includes bitumious surface treatments of gravel in Maine, water bound and bituminous macadam as well as bituminous concrete in most of the North Atlantic States, sand asphalt in Cape Cod Massachusetts, road mixes on Long Island New York, heavy subbases of run-of-bank gravel in the heavy frost states such as Massachusetts.

Many of the engineers responsible for these early developments have since gone into other states and have still further advanced the art of road building.

In recent years, advancement in design and construction methods have been most noticeable in States to the west and south of the North Atlantic area; for that reason this paper concerns present practice and present problems and what is being done to solve these problems throughout the United States. In this connection I am greatly indebted to A. C. Benkelman and his work as Chairman of the Highway Research Board's Committee on Flexible Pavement Design.

Presented before the Association of State Highway Officials of North Atlantic States; Washington, D. C., March 12, 1954. Mr. Connor, who retired recently as Principal Highway Engineer with the Bureau of Public Roads, is chairman of the Department of Design of the Highway Research Board. Author of numerous papers and books, Mr. Connor is a leading authority on low cost roads.

#### Roads vs. Bridges

Highway engineers are responsible for the design and construction of pavements and bridges. Both are commonly referred to as engineering structures vet, as such, they are vastly different. Unlike other structures, a highway pavement extends for great distances over the surface of the earth, traversing and supported by soils of a variety of types whose condition continually changes with time and climatic environment. On the other hand, a bridge or building encompasses a relatively small area, involves fewer soil types and is supported well below the earth's surface where the condition of the material undergoes little change.

Another significant distinction between the two types of structure is that pavement failures do not ordinarily endanger human life nor cause as great an economic loss as is the case of a bridge or building failure.

Thus, it is that pavements can be, and are, built without the benefits usually associated with the use of a factor of safety, while such a factor is customarily employed in the design of other structures. This state of affairs has been responsible to a large degree for the construction of pavements over the years, the design of which has in many cases proven inadequate.

The fact that the development of flexible pavement design methods has been an exceedingly difficult task is due to the many variable factors entering into the problem. Among these are (1) character and condition of the subgrade soil, (2) wheel load, volume and character of traffic, (3) changing climatic conditions, and (4) character of material used in construction. The importance of the role that all of these factors play in the design of flexible pavements, is, however, well recognized. As will be brought out later, the majority of our current methods of design take them into consideration.

The discussion that follows deals primarily with the developments that have taken place in the field of structural design of the flexible type pavement. At one time the design of such pavements was based largely upon the experience and judgment of the engineer. This meant that as a general rule insufficient attention was paid to the character of the subgrade soil and to the quality of the materials used in the construction of the pavement itself. Had stage methods not been employed in building such pavements it is doubtful under the circumstances if our experiences with this type of construction would have been such as to justify a continuation of its use. What may be accomplished by the use of stage methods of construction is well known and will not be discussed here except to say that it serves to strengthen localized weak areas as well as to improve the ability of a particular road as a whole to

#### **General Design Principles**

What has been accomplished during recent years in the way of improving our methods of flexible pavement design, has come about largely as a result of the knowledge that we have acquired from study of the engineering properties of soil and those materials which make up the structure. We now know that for a given pavement the over-all thickness of the structure must vary in accordance with the character and condition of

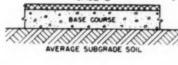
the subgrade soil. We also know that the component materials of the pavement must conform to certain standards of quality or they may lack sufficient internal stability within themselves to resist failure. We know too that they must be compacted to an extent such that additional appreciable consolidation will not occur under traffic.

The initial move to consider in a serious way the character of the subgrade soil in pavement design occurred in the early 1930's, following the developement of the B P R's group system of soil classification. At about this time several of the state highway departments adopted the practice of arbitrarily varying the total thickness of pavement, in accordance with the character of the soil as determined by this system of classification. A few years later the idea of evaluating the soil by means of small-scale strength tests was advanced; during World War II many of our airport pavements were built using a method of design revolving around the now well-known CBR test.

Following the war a very considerable acceleration of interest in the development of improved methods of designing flexible pavements occurred. This has been due in no small measure to the obvious fact that a large part of our mileage of such pavements was not built to accommodate the increase in weight and volume of traffic that was taking place. In many roads structural damage of a serious general nature was developing. In others the trouble was more localized in nature, indicating that the original design did not properly



CASE I



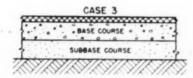


 Figure 1. Relative position of pavement components.

take into account the varying character of the subgrade soil.

Recent publications of the Highway Research Board contain detailed descriptions of a number of the more recent methods of design that are being used by the state highway departments. Many of the methods were developed by studies of pavements in service. Thus, they supposedly result in designs that on a basis of past experience should render satisfactory service. Most of them provide for the systematic consideration of the important factors involved; namely, the character of the subgrade soil and pavement materials, of the traffic loadings and of the existing climatic

#### **Present Design Methods**

The present status of the manner in which the states are handling the problem of flexible pavement design is shown quite clearly by the results of a nation-wide survey, completed in 1952 by the Committee on Flexible Pavement Design of the Highway Research Board. This survey was planned not with the idea of obtaining the complete details of the methods, but rather to compile information dealing with the essential features of the methods. Since the results of the survey are presented and discussed in considerable detail in a recent publication of the Highway Research Board, only the most significant of the findings will be summarized here.

According to Table 1, all 48 states utilize one or more of 29 different methods of evaluation of the subgrade soil in their design procedure, the CBR test being the most widely employed (17 states), followed by the group index method (13 states). However, of the 17 states employing the CBR test only 5 rely on its use alone. And of the 13 employing the group index method, only 2 use it to the exclusion of other methods. Furthermore, as is indicated in the published report, all the methods employed for evaluation of the subgrade soil can be grouped in the following general categories:

- Physical characteristics 33 states.
- 2. Strength tests 30 states.
- Detailed field surveys 6 states.
- 4. Experience and judgment 2 states.

The data in Table 1 shows also that 46 states consider the item of traffic loadings in five different ways in their design methods. The two methods of widest usage are termed volume (32 states) and wheel load (18 states). Of the 32 states using volume

#### Table B

Methods used in evaluating the subgrade for design purposes

Method	Number of states
Field soil surveys	6
PRA - 1942 soil classification	4
CBR modified	4
CBR and HRB soil classification	- 3
HRB soil classification	3
GI	2
Hveem stabilometer	2
Triaxial compression	2
CBR and GI	2
CBR modified and GI	1
CBR, NDC and GI	1
CBR, HRB and GI	
HRB soil classification GI Hveem stabilometer Triaxial compression CBR and GI CBR modified and GI CBR, NDC and GI CBR, HRB and GI Field CBR and plate bearing CBR, CBR and density	
CBR, GI and density	1
CBR modified, PI, percent passing	200 sieve
and R value	
CBR only	1
PRA — 1942 soil classification, Hi and CBR	RB - GI
PRA - 1942 soil classification and	G1 1
PRA = 1942 soil classification a shear	1
GI and drainage	1
GI and modified stabilometer	1
GI and soil constants	1
Plate bearing	1
NDC and experience	1
PI and percent passing 200 sieve	i
Florida bearing	1
Textoral soil types	
Experience and judgment	1
Georgia standard	1
Total	48

of traffic as the criterion, 23 do so exclusively, and of the 18 states using the magnitude of the wheel load only 10 do so to the exclusion of other methods. Climate is considered by 35 states using eleven different methods. Those of widest usage are frost (20 states) and rainfall (11 states). Of the 20 states using frost as the criterion, 11 do so without considering other elements of climate, and of those using rainfall as the criterion only 2 do so exclusively.

#### **Thickness Components**

In Table 2, data are shown that deal with the methods reported by the states for determining the thickness of the individual components of the pavement. In the case of the wearing course, 44 of the 48 states make use of 16 different methods for doing this, experience being the method of widest indicated usage (23 states), followed by traffic (15 states). Of the 23 states basing the thickness of surface on experience, 16 do so without resorting to the use of other criteria and of the 15 states basing this determination on traffic only, 6 consider this method alone, Much the same story holds for determination of the thickness of the base course, experience and traffic being the predominating considerations. In the case of the subbase course the methods of widest usage are experi-

TABLE 1-METHODS FOR EVALUATION OF SUBGRADE,
TRAFFIC LOADINGS AND CLIMATE

	SUBGRADE	TRAFFIC	CLIMATE
TOTAL NUMBER OF STATES REPORTING A METHOD	48	46	35
ACTUAL NUMBER OF DIFFERENT METHODS REPORTED	29	5	11
METHODS OF WIDEST USAGE AND NUMBER OF STATES USING THEM	COR TEST 17 GROUP INDEX 13	VOLUME 32 WHEEL LOAD	FROST 20 RAINFALL
NUMBER OF STATES USING MOST COMMON METHOD ONLY	CBR TEST 5 GROUP INDEX 2	VOLUME 23 WHEEL LOAD 10	FROST 11 RAINFALL 2

TABLE 3 - METHODS FOR DETERMINATION OF QUALITY OF WEARING COURSE, BASE COURSE, AND SUBBASE COURSE MATERIALS

	WEARING COURSE	BASE	SUBBASE COURSE
TOTAL NUMBER OF STATES REPORTING A METHOD	39	38	37
ACTUAL NUMBER OF DIFFERENT METHODS REPORTED	25	23	25
METHODS OF WIDEST USAGE AND NUMBER OF STATES USING THEM	MARSHALL TEST 13 GRADATION 12	GRADATION 19 SOIL CONSTANTS	GRADATION 20 SOIL CONSTANTS
NUMBER OF STATES USING MOST COMMON METHOD ONLY	MARSHALL TEST A GRADATION	GRADATION SOIL CONSTANTS	GRADATION SOIL CONSTANTS

ence and the CBR test.

The data presented in Table 3 concern the methods reported for determination of the quality of the wearing, base and subbase course materials. These data, as pointed out in the published report of the study, are not as directly related to the problem of thickness design as those presented in tables 1 and 2. They show that 39, 38 and 37 of the states use 25, 23 and 25 different methods of de-

TABLE 5 - TYPICAL PAVEMENT DEFLECTION DATA

TOTAL	OWP DE	FLECTION	IWP DEFLECTION	
THICKNESS -INCHES	AVERAGE -	RANGE -	AVERAGE -	RANGE -
13.	.033	012-042	.035	020-042
19	.037	024-056	034	.014 -052
25	039	026-068	.036	026-048
35	.044	018-077	.039	026-048
38	.041	.026-056	.038	026-048
GRAND AVERAGES	.039		.036	

TABLE 2 - METHODS FOR DETERMINATION OF THICKNESS OF WEARING COURSE, BASE COURSE, AND SUBBASE COURSE

	WEARING COURSE	BASE	SUBBASE
TOTAL NUMBER OF STATES REPORTING A METHOD	44	44	44
ACTUAL NUMBER OF DIFFERENT METHODS REPORTED	16	24	28
METHODS OF WIDEST USAGE AND NUMBER OF STATES USING THEM	EXPERIENCE 23 TRAFFIC 15	EXPERIENCE 15 TRAFFIC 14	EXPERIENCE 18 CBR TEST
NUMBER OF STATES USING MOST COMMON METHOD ONLY	EXPERIENCE 16 TRAFFIC 6	EXPERIENCE 10 TRAFFIC 2	EXPERIENCE 10 CBR TEST 3

TABLE 4 - PERIOD OF USAGE OF CURRENT DESIGN METHODS (MARCH 1952)

NUMBER OF STATES	TIME PERIOD - YEARS
12	0-5
18	6-10
7	11-15
4	16-20

termining the quality of the wearing, base and subbase materials respectively. In the case of the wearing course the Marshall Test leads in terms of usage (13 states), followed by gradation tests (12 states). Of the 13 states using the Marshall Test only four do so exclusively and of the 12 states reporting that gradation is the criterion of quality, only one relies on this criterion alone. In the case

of the base and subbase materials,

information obtained from gradation and the soil constant tests is most widely used. However, only a few states use this information as the sole criterion of quality.

The material presented in Table 4 shows the period of usage of 41 of the design methods as reported by the states. It serves to emphasize the fact, previously expressed, that a considerable number of the states have revised their methods or developed or adopted new ones during recent

years. Specifically the material in the table shows that 30 of the states are using methods 10 years old or less, and that 12 of the 30 have methods dating back only 5 years.

An ideal method of design, of course, is one that provides for the determination not only of the over-all thickness of pavement but of the thickness of each of its components as well. In the survey of design practices only two of the states admitted the use of "experience and judgment" in evaluating the subgrade, while 23 states reported the use of this criterion in determining the thickness of the wearing course, 15 the thickness of the base and 18 the thickness of the subbase course. Thus it would appear that the total thickness of pavement is determined by some definite method of subgrade evaluation whereas some less definite method is employed in arriving at the thickness of the individual pavement components.

As stated before the nation-wide survey of design prac-





 Lever-type deflection indicator. Reading before and after truck moves forward. "Washo" test road, Malad. Idaho.

tices concerned principally the compilation of factual data regarding the essential features of the methods. For example, no attempt was made to determine how the results of strength tests of the subgrade soil are converted to thicknesses of pavement nor exactly how the thickness of pavement is varied for different permitted wheel loads or for different volumes and character of the traffic. However, information of this nature may be found in various publications of the Highway Research Board for some 15 of the state highway department methods of design.

From the foregoing it is evident that during the past 10 years measurable strides have been made in the development of improved methods of designing flexible pavements. The majority of the methods are empirical in nature and provide for a systematic consideration of the fac-

tors involved, including the character of the subgrade soil, the amount of traffic, climate, and the character of the pavement components.

The results of the Highway Research Board's survey are thus seen to be of particular value in indicating the variety of approaches being employed. And these findings emphasize the need for comparing different methods by studying scientifically both the behavior of pavements in service and, preferable, those in special testroad projects where weight and frequency of the imposed traffic can be regulated and controlled.

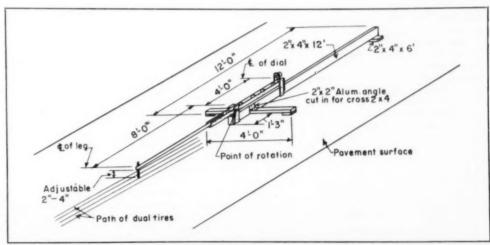
#### Flexible Roads In Service

In order to get a realistic though limited view of the types of flexible pavements constructed since 1950 the plans, specifications and estimates of more than 400 projects in the 48 states were recently examined. From them some 40 projects were selected as being reasonably typical of those constructed and in use in 30 states.

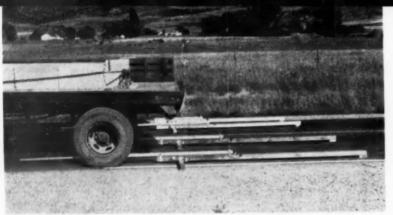
Substantially all bituminous surfaces were from 20' to 24' in width, with a majority 24 feet wide.

Surface types ranged from surface treatment % inch thick for light traffic roads (300 v.p.d.) to hot mix bituminous concrete 3" thick or bituminous macadam 2½ inches thick for fairly heavy traffic roads, of 5000 v.p.d. .There were also various projects of road mix for intermediate traffic volumes.

Base courses were generally of untreated gravel or stone including waterbound and also traffic bound macadam, some were of sand clay or other local materials and a few were of stabilized soil. Untreated base thickness averaged from 4 to 15 inches with some of 18 and 19 inches where truck traffic was heavy and soil subgrade was poor; base courses were relatively thinner where admixtures of cement or bitumen were used to stabilize the materials. Subbases ranged in thickness from 6 to 18 inches and their use and thickness appeared to depend largely on subgrade soil type and volume of truck traffic. Although no mention was made of frost penetrating, thicker



• Figure A. Design features of Benkleman pavement deflection indicator.



 Another view of lever-type deflection indicator — several units being used under one load.

sections are known to be used up to a total of 30 inches where frosts are deep.

From maintenance reports on the projects studied it was found that failures requiring repairs within the first 18 months of normal use appeared negligible. More recent reports were not available.

#### **Rational Design Problem**

In general, available reports and data based on experience have indicated that over-all thickness of flexibile pavements should vary from bituminous surface treatments on thin bases for very light traffic, to total thickness of 22 inches and more on very poor subgrades for large volumes of heavy truck traffic. There is not too much difference of opinion on this since such variations are well established by actual practice in many localities. The real problem is the determination of rational design for conditions between these extremes and that is why further research and its proper interpretation are necessary.

A practical approach combining tests with experience already is being made by at least two States, Kansas and Texas. In order to determine how strength tests of subgrade can be converted into thickness of pavement they took samples of wearing surface, base course, subbase course and subgrade soil, tested them by laboratory tests and then correlated the laboratory findings with character and volume of traffic using these pavements, from which they developed their present design methods.

Comparatively recent developments which should be watched with interest are:

- a) Greater use of subbases on poor subgrade soils.
- b) Stabilization of poor materials for bases or subbases by use of admixtures where good materials are not available.
- c) One-course construction of relatively thick macadam bases by com-

bined use of vibrating equipment and rolling.

d) Use of crusher-run stone, slag or other aggregate for base course.

e) Use of bituminous penetration macadam or plant mixed macadam for base course, topped with hot mix asphaltic concrete.

f) Improvements on mixing plants and pavers.

Because of the increase in weight and volume of truck traffic the difficult and immediate problems are (1) how best to improve inadequate

pavements now in service, and (2) how best to design and construct pro-

posed new pavements.

The need of some simple method of evaluating pavements in service has long been evident. This need appears to be met by an inexpensive, simple and portable device recently developed and now in use for measuring deflection of pavements under moving loads. The devise, known as The Benkelman beam, was worked out by A. C. Benkelman of the Bureau of Public Roads in connection with the WASHO road test at Malad. Idaho. It measures deflection of the pavement surface caused by the wheels of loaded truck or trailer as the vehicle moves forward at critical creep speed.

The Beam can be put to very effective use by State and local Highway Departments in evaluating existing pavements, in establishing seasonal load limitations so important in preserving investments in existing pavements, and in planning maintenance budgets and costs of reconstruction of existing pavements. The use of this Beam now makes possible a direct approach for checking the validity of the design of pavements by actual measurements on the pavements as constructed.

A sketch of the deflection measuring device is shown in figure A. It consists essentially of a light-weight lever arm, the fulcrum of which is mounted on one end of a wooden datum beam. A leg extends down-

ward from the free end of the lever arm, the foot of which contacts the pavement surface. The other end of the lever arm actuates a micrometer dial gage, (an Ames dial was used) which is attached to the datum beam.

How best to design and construct new flexible pavements is being undertaken by a number of agencies and they include;

a) Cooperative investigation at Hybla Valley, Virginia, by Bureau of Public Roads, Asphalt Institute and Highway Research Board.

b) Western Association of State Highway Officials road test in Idaho.

c) Proposed AASHO road test in Illinois.

d) Studies started by Civil Aeronautics Administration in connection with airports, at Indianapolis, Indiana, and now being taken over by the U. S. Navy.

e) Stress distribution research by U. S. Corps of Engineers at Vicks-

burg, Mississippi.

f) Studies of pavements in service to check validity of method used in their design, notably in Texas and Kansas.

The combined efforts of all these and other organizations should result in the development of improved and standardized procedures for designing flexible pavements to carry loads of known weights and volumes.

#### In Summary

This paper has pointed out present practice and the problem of designing flexible type pavements to meet modern traffic needs. It has shown that thickness design is complex; that developing acceptable methods of design generally applicable is difficult but shows tangible progress. Progress is evidenced by general agreement on desirable types and thickness of bituminous wearing surfaces, as well as suitable types and approximate thickness of base courses. Recognition of the importance of subgrade support and the use of a subbase of appropriate thickness when subgrades are poor are emphasized.

Direct methods for evaluating the load carrying capacity of existing pavements are well under way. Present and proposed field road tests on special test roads are showing and will, no doubt, continue to show important developments in flexible pavements as to type, thickness and width of sections needed for modern heavy traffic.

It is felt that gratifying and substantial progress has recently been made in the development of flexible type pavements and that the near future will reveal more important developments.

# Getting a Good Lay-Down on Asphalt Paving Work

Notes on state highway department methods and problems in the proper spreading, rolling and inspection control of hot-mix surfaces

RECENTLY the Editors of ROADS AND STREETS addressed a letter of inquiry to several state highway department engineers concerned with the getting of good workmanship on hot mix bituminous surfacing. Inspired indirectly by a round-table discussion on the subject at the AASHO meeting in Pittsburgh in 1953, this letter asked for informal remarks on the problems and essentials of finishing, getting a good centerline joint, proper rolling, etc., and of getting a smooth riding, good quality lay-down generally. The following excerpts from the replies in general pertain to both contract and force-account work, and apply in particular to resurfacing of old pavements.

By L. A. French

Bituminous Engineer, North Dakota State Highway Department, Bismark

Most contract bituminous construction in North Dakota is with 120-150 and 150-200 penetration asphalt and hot plant mix, requiring laying machines. A large portion of our trouble in securing a satisfactory job can be traced to finishers which are not kept in proper operating conditions.

We feel that a large portion of the responsibility for a good job rests on the resident engineer. Weather conditions, type of asphalt, characteristics of the aggregate being used, and type of construction must all be taken into consideration in securing a satisfactory job.

There are few hard and fast rules that can be established covering the proper time and amount of rolling. While we do not specify the required density, preliminary tests in the laboratory indicate the density that can be secured for each type of aggregate combined with the correct percentage of asphalt.

Field density tests are taken on the completed pavement and we endeavor to obtain densities that compare favorable with the laboratory results, realizing that some additional density will be developed under traffic.

By G. F. Hellesoe

Maintenance Engineer, California Division of Highways, Sacramento

The quality of materials used is the most important factor in getting a good bituminous resurface. We are becoming increasingly aware of the durability of the aggregates being used, requiring that they be as nonabsorptive as possible and have the least tendency to degrade under the use expected. The most desirable characteristic of the grading is that the amount of 200-mesh material be kept below 5%; the grade of asphalt used is approaching the range of 125 to 150 penetration. Our research on the quality of asphalt has not resolved itself to any definite conclusions as vet.

In placing the mix, it is specified that one of the several mechanical paving machines be used. Also, more engineers are learning that the use of blade laying of the mixes is not practicable when the harder grades of asphalt are used. The use of a level bubble on the machines is proving more popular for the determination of the lateral slope of the pavement.

The center line joints are improved in proportion to the even thickness of the first mat and the uniformity of the longitudinal line. The use of the strike-off plates and bar is insisted upon. The joint should be made while hot and before any traffic has broken down the original edge. While some raking or feathering of the center joint will be necessary, the minimum amount should be done. The greatest difficulty in securing a good center joint is in exactly meeting a true first mat. The first mat is not true after the edges are rolled down either by traffic or a roller. Any work done after the first mat has been distorted or chilled requires judgment and skill to correct and even with the best of operators, materials and working conditions, some poor joints will result.

Rolling of the open type of mixes

used today requires rolling similar to that used on the older asphalt pavements; the first rolling as a breakdown should be made as early as possible, with an ironing out when the pavement is cooler. The use of controlled traffic or pneumatic rollers after the original breakdown is of great benefit.

The foregoing has only touched on the highlights involved in laying "hot stuff." While the paving machines have simplified the operations, care of details is what makes the finished job look good.

By H. H. Harris

Maintenance Engineer, Virginia Department of Highways, Richmond

We perform a considerable amount of bituminous hot mix resurfacing in Virginia, and are most interested in any new methods or procedures which may improve appearance, riding qualities or pavement life. Therefore, we are very glad to describe our methods in the hopes that from your general discussions, we may benefit from the experience of others.

Bituminous resurfacing is normally applied for two major reasons, (1) to replace a worn existing surface and (2) to improve the riding qualities of the pavement.

Bituminous concrete resurfacing treatments are usually about 1½ inches in depth, and whenever the size of aggregate will permit the material is applied in two applications. It is our belief that both improved riding surfaces and increased compaction are secured through additional passes of the paver and accompanying

equipment.

The first layer or leveling course is applied for the sole purpose of eliminating depressions and improving the roadway cross section. The minimum quantities possible to secure the desired results are used without consideration of appearance. String lines and straightedges are used to determine the necessary quantities and extent of the irregularities. Assuming a total application of 165 lb. per sq. yd., we attempt to use 65 to 75 lb. for the leveling and 90 to 100 lb. for the wearing course.

In applying the wearing course, the paver is adjusted for the proper depth and allowed to operate thereafter without adjustment if possible. Rolling operations follow immediately behind the paver, or as closely as possible, to avoid blistering on fine dense mixes. The center longitudinal joint is rolled with the roller supported on the adjoining lane with only about six inches of the roller extending onto the new material. This provides maximum compaction to this section, providing a well sealed and uniform joint.

For this type of resurfacing operation we feel that two rollers should be available for each paver. It is essential that one roller be available for sealing immediately following the paver and a second to remove roller mark and do such other rolling as necessary to secure a well compacted and uniform appearing surface. Controlled traffic allowed on the newly finished pavement following final rolling will normally assist in securing a uniform appearance.

Extreme care should be exerted to prevent traffic from stopping on the new pavement as well as sharp turns or sudden starts. In those cases where it is necessary to stop traffic on new dense graded pavement, it is suggested that the pavement be covered with sand. The sand will prevent adhesion of the asphalt to the tires of the parked vehicles and will be blown from the pavement by traffic upon resumption of normal traffic flow.

## Martin's Article on Hot Plant Operation Draws Comment

#### By Harry M. Rex

Highway Research Engineer Physical Research Branch Bureau of Public Roads

To the Editor:

In his article "Pitfalls and Points in Asphaltic Concrete Production (or How to be a Hero in a Hot Mix Plant)" published in your May 1954 issue, Mr. J. Rogers Martin portrayed in a very engaging manner some of the vexations that beset the engineerinspector assigned to a hot-mix asphalt paving plant.

Without the slightest wish to dim the aura of heroism with which Mr. Martin surrounds this mythical paving plant inspector as he solves the various hypothetical problems mentioned in the article, the undersigned feels that a reference seriously discouraging the use of certain test methods should not go unchallenged. Making specific reference to A.A.S.-H.O. Designations T 11-49 and T 27-46, Mr. Martin characterizes standard testing methods for determining the percentage of material finer than the No. 200 sieve as "a booby-trap."

Aggregate material of 200-mesh size may occur in the finished asphaltic mixture in several forms: (a) as a coating around larger aggregate particles, (b) as a cementing material, if plastic, resulting in the formation of clay-balls or of agglomerations of sand and clay particles, and (c) as discrete particles acting as filler. Determination of the amount and form of this finely divided material is essential to good design and

control. Dry sieving too often fails to provide this information. Clayballs and agglomerations of clay and sand particles in the final mix are considered to be objectionable; their occurrence can usually be detected by visual examination of hot bin samples and samples of the finished mixture. Every effort should be made to avoid mistaking these clay balls or agglomerations for single sand particles of the same size. Under certain conditions films of finely divided material around coarser aggregate particles may seriously affect their proper coating by the asphaltic binder. In fixing the percentage of filler material in the final mixture, allowance should always be made for any 200-mesh material that may be clinging to the surfaces of the larger aggregate particles even after having been subjected to dry-sieving. Such material may be plastic or non-plastic, consequently Mr. Martin's distinction with respect to whether or not "all of the aggregates going into the mix are completely clean (zero plasticity index)" is of doubtful value.

The author of the article implies that it is of paramount importance to achieve agreement between mix design grading and plant gradings of extracted aggregates. It is suggested that a knowledge, as complete and accurate as possible, of the mineral aggregate component as it occurs in the finished asphaltic mixture is of even greater importance. Moreover, discrepancies between results of sieve analysis of aggregates extracted from the finished mixture on the one hand

and results of tests of aggregates sampled prior to the mixing operation on the other should not be considered inevitable. The procedure described in A.A.S.H.O. Designation T 30-37 for the mechanical analysis of extracted aggregates provides for a wetsieving method of separating the 200mesh material, using gasoline as the washing medium. There is now pending in the A.A.S.H.O. Committee on Materials a proposed revision of this procedure permitting the use of water, to which a suitable wetting agent has been added, as an alternate to the use of gasoline. This alternate method has been employed in the Public Roads laboratory for the past several years with satisfactory results. If wet-sieving methods are used throughout, the discrepancies deplored in the article can be eliminated.

The standard test methods cited were developed as the result of many years of experience and while they may not be wholly satisfying from all points of view, surely reasons for recommending their abandonment should be more cogent than the one advanced by Mr. Martin.

The foregoing remarks should not be construed as insinuating criticism of the entire article, which except for the reference noted is both interesting and informative.

## Indiana north-south toll road route endorsed

A Chicago to Indianapolis toll expressway 140 miles long and to cost an estimated \$225 million has been endorsed by the Indiana Toll Road Commission. Engineering studies required by law before a toll road can be approved in Indiana, have been completed and sent to Governor Craig for approval.

The highway would have its northern terminal at Hammond on the southern edge of Chicago, where it would tie in with the Indiana eastwest expressway already financed and now in the design stage. The road would end at U.S. 40 just outside of Indianapolis, and form part of a projected route to the Ohio valley.

#### Costs down first quarter

The composite mile index of highway cost, compiled by the Bureau of Public Roads, dropped to 152.0 the first quarter of 1954, or 8 per cent below the first quarter of 1953 and 3 per cent below the previous quarter. Common excavation contract prices for the quarter averaged \$.36, down 10 per cent; concrete pavement \$3.63, down 9 per cent; structural concrete \$52.00 down 4 per cent.



"Black-Topper" covers gravel windrow on road-mix job near Fenton, Mo.
Road grader follows distributor.

Pumping asphalt to stabilize pavement subgrade.

# Etnyre proves itself to Missourians!

"I'm from Missouri" holds true when it comes to buying bituminous distributors, too. Investigation by Missouri Petroleum Products of St. Louis, Missouri indicated that the Etnyre "Black-Topper" would do the best job. Five years' experience has proved the buying decision was right.

Even distribution, ease of operation, simplicity of control, and maneuverability are factors which make the Etnyre a superior machine, in the opinion of Mr. F. L. Hunter, plant superintendent. The firm has found the "Black-Topper" particularly suitable for pumping heavy asphalt under broken or fallen pavement to stabilize the concrete subgrade.

Be "from Missouri" yourself. Check into the many operating advantages of the Etnyre design. Find out why it's the favorite of operators everywhere. Satisfy yourself that the "Black-Topper" offers you greatest value for your dollar. See your Etnyre dealer or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

SEE YOUR ETNYRE DEALER

ETNYRE

"Black-Topper"



# WHAT'S NEW in EQUIPMENT and MATERIALS

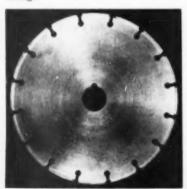
Use bound-in postcard for convenience in inquiring about these products or those described on advertising pages.



• The Cat D9X Tractor, the world's most powerful crawler, is being tested extensively this summer. Several experimental models will be observed closely by Caterpillar Tractor Co. field engineers and product application personnel during the testing period. The program to work these tractors in a variety of heavy-duty applications follows the Company's practice of conducting experimental work under actual customers job conditions.

#### **Concrete Sawing Blade**

A completely new concrete sawing blade, the "Clyde Duo-Bond," claimed to substantially reduce concrete cutting costs, especially for contraction joint sawing in new concrete, has been announced by the Clyde Co., P. O. Box 72, Racine, Wis. In Clyde Duo-Bond blades, the diamond bond is specially fortified by a new exclusive process to provide an extremely hard cutting edge which greatly resists abrasion and wear, thereby reducing costs by increasing footage.



Clyde Duo-Bond Concrete Sawing Blade

Another important factor is that the blades are built to provide a sufficiently wide cut for easy application of all types of joint sealers. The blades are offered in 12-in. diameter to fit any make of concrete sawing machine.

#### Bucket Loader for Loading Trucks

A new heavy-duty bucket loader, with hydraulic operated swivel discharge conveyor, announced by the N. P. Nelson Iron Works, Inc., 852 Bloomfield Ave., Clifton, N.J., is specifically designed to handle high-speed high-capacity truck loading at lowest possible cost. Available in two models, the P-11B mounted on rubber tires and the Q-11B mounted on crawlers, a loading capacity up to 4 cu. yd. per minute is reported. The hydraulic operated swivel discharge conveyor turns a full 180 degrees, discharges at heights of over 14 ft. and has a reach of over 11 ft. This height and reach allows large trucks with sideboards to be loaded quickly and easily from front to rear without maneuvering back and forth under chute. With the discharge conveyor swinging 90 degrees to either right or left of front discharge point, it is unnecessary to "spot" trucks in a fixed loading location.



Heavy Duty Loader with Swivel Discharge Conveyor

#### **Rotary Air Drill**

A new rotary air drill for heavy-duty service has been announced by Davey Compressor Co., Kent, O. Designated as Model M-8A, it is recommended for core drilling, water well drilling, structure testing and the drilling of shot and blast holes. Because of its employment of a new "air-blast" technique, it is said to drill faster and more economically. Rated capacity of the drilling machine is 5% in. holes to a depth of 150 ft. with air and 6% in, holes to 1,000 ft. with mud. Suitable for mounting on any make of truck, the rotary drill may be driven by a power take-off from the truck engine or by a separate gasoline or diesel engine. Its 8-in. rotary table has a capacity sufficient to support and rotate 100,000 lb. loads. Draw works are of the 2-drum type, with line capacity of 470 ft. of ½ in. line per



Model M-8A Drilling Blast Holes for Coal Mining

#### **Post Driver and Tamper**

The Danuser driver and breaker has been added to the Dearborn equipment line of Tractor and Implement Division, Ford Motor Co., Birmingham, Mich. Designed for one-man operation, a single lever controls the 200-lb, drive weight through its complete operating cycle. Striking 25 blows per minue, the Danuser driver and breaker will drive steel or wood posts up to 8 ft. long and 6 in. in diameter.

Among the uses of this versatile tool are driving wood or steel guardrail posts, driving snow fence posts, tamping soil or gravel and breaking concrete walks, driveways and roadways.



Danuser Driver and Breaker

A pitch control wheel on the top link allows the operator to adjust the driver quickly for use on hillsides or uneven ground. A steel post cap is used when driving posts and a breaker head is provided for breaking concrete. The Danuser driver and breaker attaches quickly to the Ford tractor's three point hitch and is PTO driven.

#### **Paving Material Spreader**

A new spreader, Model 710, announced by Essick Manufacturing Co., 1950 Santa Fe Ave., Los Angeles 31, Calif., is claimed to include design features that reduce costs and time required to do a finished paving job. The Essick Model 710 material spreader is furnished with two steel skids and a roll. The two 8-ft. long removable steel skids can be quickly attached to each end of the adjustable spreader blade and serve as a guide for leveling the high and low spots of the base grade.

The roll is furnished complete with a large capacity fluid tank and sprinkier system that keeps the cold or hot black-top materials from sticking to the surface of the roll. The roll when attached to one end of the spreader and set even with the bottom of the spreader blade operates on the level of the finished paving surface. One of the steel skids attached to the blade-end opposite the roll is adjustable to maintain a level blade clearance as required by the paving specifications. Another outstanding design feature of the Essick spreader is an adjustable blade providing widths from 7 to 10 ft.



Essick Model 710 Material Spreader

#### Bucket Dumps to Both Side and Front

Loading out windrowed materials to the side as well as straight-line loading in cramped work areas are stated to be jobs particularly well-suited to the Isaksen side dump bucket for Baker-Lull frontend hydraulic loaders. Bucket also dumps forward. Manufactured by the Baker-Lull Corp., 922 West 90 St., Minneapolis 20, Minn., this bucket interchanges with % vd. and 1% vd. buckets now in use on Case, Minneapolis - Moline and Oliver wheel tractors. Illustration indicates how loading out windrows is quickened by the side dump bucket; tractor remains in parallel position with vehicle receiving load. Thus, there's no jockeying for dumping position.



Loading with Side Dump Bucket

#### Overhead Valve Tappet Adjusting Wrench

A new wrench designed especially to adjust overhead valve tappets is the latest development in the line of Owantonna Tool Co., 417 No. Cedar St., Owatonna, Minn. The new OTC wench has a standard ½ in. square drive which permits the use of standard sockets. The transparent, plastic handle provides a good grip and the large adjusting knob gives ample leverage to turn the adjusting screw.



Overhead Valve Tappet Adjusting Wrench

#### Hydrocrane Available as Self-Powered Unit

The truck-mounted Hydrocrane, an all-hydraulic 4-ton, % yd. crane-excavator of Bucyrus-Erie Co., South Milwaukee, Wis., is now available as an independently powered machine. It has been designed to increase horsepower and line speeds, simplify operation, reduce maintenance, improve efficiency, and extend truck engine life. While retaining all of the advantages of the original power-takeof driven Hydrocrane, this new-type Hydrocrane has its own self-contained power unit, a 4-cylinder industrial-type engine



has no equal for efficiency, durability and safety in every high or low pressure hose service . . . steam, water, gas, air, oil, hydraulic. Ground joint union between stem and spud provides leakproof, trouble-free seal. Furnished with super-strong, "Boss" Offset and Interlocking Clamp.

COUPLING



All parts steel or malleable iron, thoroughly rustproofed. Sizes ¼" to 6", inclusive.

Steckéd by Manufacturers and Distributors of Industrial Rubber Products





### PORTABLE BATCH TYPE ASPHALT PLANT

(MODEL TM)

At last . , . a completely portable batch type asphalt plant . . . designed to meet the demand for a plant portable enough to move economically yet provide the capacity and accuracy required for specification work. Capacity is 40 to 50 tons per hour. Ordinarily operated by one man. The exclusive STANDARD "Self-Lift" erecting device elevates the mixing cage in as little as 30 minutes. Fast dismantling, hauling and erecting eliminates need for long, expensive asphalt hauls.



#### HAUL IT Anywhere!

rertect for rural areas . . . for hard-to-reach locations, for state highways and county and township roads. Truck tractor hauls plant easily. Now you can profitably handle jobs that size and distance formerly eliminated or made extremely expensive.

#### READY FOR OPERATION In A Few Hours!

The entire unit, including cold and hot elevator, can be put in working position in as little as 2½ hours. Estimated erection or dismantling time for complete plant, including boiler and storage tank, is approximately one day. Built for years of the most rugged service, the STANDARD portable plant will stand up under both









Self-Powered Hydrocrane

permitting the utilization of 58% more horsepower.

In addition to eliminating the restrictive influence of the power-takeoff drive, the self-powered Hydrocrane features an improved hydraulic circuit. A foot-operated selector valve permits hydraulic fluid from all three pumps to be channeled to one valve bank, increasing line speeds up to 50 per cent. On the Hydrohoe -Bucyrus - Erie's all-hydraulic dragshovel - digging power is much greater, hoist speeds faster. Both the Hydrocrane and Hydrohoe are now available as truckpowered or self-powered units.

#### Safety Attachment for Moto-Bug

A new safety attachment is now optional on all S-10 type Moto-Bug, according to an announcement by Kwik-Mix Co., Port Washington, Wis., a subsidiary of Koehring Co., Milwaukee, Wis. It is an operator's guard and support which is welded to the riding step before the Moto-Bug leaves the factory. The guard and support adds to the safety of Moto-Bug operation by holding the operator upright in case of a sudden jolt which might throw him off the riding step. The simple but effective device is a heavy gauge steel upright post ending in a broad curved steel plate. With this support and guard, the operator is not only protected from shock but given a back support which will reduce fatigue during extended operating periods.



Moto-Bug with Saftey Attachment

#### Spreader Has "Staggered Wheel" Arrangement

A new bituminous concrete and aggregate spreader has been announced by Highway Equipment Co., Inc., 616 D Ave., Northwest, Cedar Rapids, Ia. This new inexpensive towed-type spreader features an exclusive "staggered wheel" arrangement consisting of 10 pneumatic tired wheels which keep the unit level at all times — maintaining a level finish course. The screed is fully adjustable in height by dual controls at each end which permits spreading depths from ½ in. to 8 in., and when the controls are in the locked position, a consistant desired depth of control is guaranteed.



New Model Spreader

It handles rock up to 4 in. in size for base course. Another important feature is the hydraulically operated shut-off gate which allows the operator to start or stop the flow of material from the hopper. This eliminates the dribbling at the beginning or end of each strip. Four sizes are available, 8 ft., 9 ft., 10 ft., and 12 ft. spreading widths, with cutoff plates to adjust width of spread.

#### **15-Ton Transit Crane**

A new 15-B transit crane mobile crane-excavator with 15-ton rated lifting capacity offered by Bucyrus-Erie Co., South Milwaukee, Wis., designed to handle fast and efficiently the many types of work now considered too small or restricted for profitable large machine operation. The wheel mounting is manufactured exclusively for Bucyrus-Erie by White-Sterling and built specially for crane-excavator service. The mounting is powered by a 138 HP gasoline engine, equipped with single wheels in front and tandean duals in rear with 170 in. wheelbase. A heavy duty 50 speed transmission mounted in unit with engine and 2-speed auxiliary unit mounted in truck frame combine to provide 10 forward speeds to a maximum of 31 mph and two reverse speeds.



A method of cleaning tools with diesel oil that saves the contractor 20% of his labor time.

#### KENNETH C. STOOPS

Manufacturer and Distributor

P.O. Box 272

Walnut Creek, Calif.

# SURFACE and INTERNAL VIBRATION for CONCRETE PAVING



INTERNAL TYPE

Tubes vibrate deep in concrete. One unit, as shown, for each 5'-0" (maximum) of slab width. Usually attached to front of finisher.



Tube vibrates on surface. Accomplishes thorough densification of 10" cencrete slabs. One unit, as shown for each 6'-0" (maximum) of slab width. Usually attached to rear of spreader.



# JACKSON GIVES YOU BOTH!



A 25', 5-motor Tube of the internal type quickly plasticizing a tough mix on thick slab construction.

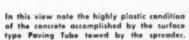


On this job, on which no spreader was used, the Paving Tube materially reduced the cost of spreading concrete.

The contractor who owns a Jackson Paving Tube can quickly switch from INTERNAL to SURFACE vibration, or vice versa, and meet any concrete slab specifications—at a minimum of equipment investment.

Supplied with extraordinarily powerful motors, the JACKSON INTERNAL Paving Tube will thoroughly vibrate all concrete slabs as thick as 24" and as wide as 25', quickly plasticizing the very dry, harsh mixes. Attached to a standard finisher, its use materially reduces spreading labor where no spreader is used. Adapted to SURFACE vibratory operation, it will do a perfect job of vibrating any mix in depths up to 12". Powered by a Jackson Portable Power Plant mounted on parent equipment and controlled by its operator.

For better results and lowest possible costs buy a JACKSON Vibratory Paving Tube. See your Jackson distributor or write for complete details.



JACKSON VIBRATORS, INC.





New 15-B Transit Crane

Standard equipment also includes front and rear manually controlled telescoping outriggers. Standard crane boom is 30 ft. long, extendible to 70 ft. by using removable inserts.

#### **Engine Has Heat Exchanger**

Built and equipped for 24-hour continuous heavy-duty operation the new 800-6A power unit of Minneapolis-Moline Co., Minneapolis 1, Minn.; new 800-6A power unit has the exclusive MM heat exchanger base pan as regular equipment. This pan is water jacketed and acts as a heater or cooler to maintain a uniform and proper oil temperature. Heavyduty thermostats maintain uniform temperature from cylinder head to base pan regardless of load or atmospheric temperature. The new large 800 cu. in. displacement engine has six cylinders, 5,5

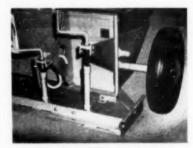


MM 800-6A Power Unit

in. bore, 6 in. stroke, and is designed for operation on gasoline, natural gas or LP gas fuels

#### **Extension Screeds for** Tru-Lay Paver

Right and left screeds with stub axle extensions are now available as accessories for the True-Lay paver of Doug-Lynn Manufacturing Co., 339 - 15th St., Oakland 12, Calif. This makes it possible to extend the width laid by the new improved standard 8.0 ft. True-Lay paver up to 10 ft. It is further claimed that by the addition of baffle plates, the width may be cut to 4 ft. The accessories may be attached with only an open end wrench in a few minutes. Also a second axle anchor has been added so the wheel will ride on the curb when it is desired to pave close to the curbing.



Close-Up Showing Dual Axle Anchor and Right Extension Screed

#### **Hydrocrane Has New Pressure Relief Valve**

Along with other Hydrocrane-Hydrohoe improvements recently announced, this all-hydraulic 4-ton, % yd. crane-excavator of Bucyrus-Erie Co., South Milwaukee, Wis., is now equipped with a new style pressure head or relief valve. Developed by the company's research and engineering department, the new relief valve is hydraulically balanced and unloads precisely when maximum permissible pressures are reached in the hydraulic system. Premature by-passing or "bleeding" is eliminated, thus maximum horsepower is made available when power demand is greatest. This results



#### CHECK THESE MADSEN FEATURES

· Exclusive bin design (Patent Pending) . . . eliminates segregation and improves aggregate distribution in weigh-box.

Improved drive arrangement for greater effi-

· Unit construction for quick, easy field erection. • Fastest mixing cycle for greater daily produc-

Get the complete story on the MADSEN Model 481 MADSEN

Write for Bulletin No. 800.



tion and mere dollars for you!

MADIEN RON WORKS, INC. 14100 E. ROSECRANS AVE., P. O. BOX 38 LA MIRADA, CALIFORNIA

faster and thereby obtain greater day-in and day-out production. And, the location of the operator station at the end of the plant, together with air cylinder operation of bin gates, weigh-box, mixer and asphalt

injection control valve . . . lessens operator fatigue and increases his work potential.

Yes, any way you look at it, the MADSEN

Model 481 is designed for greater produc-



Fleet of SWENSON-Equipped Trucks Speed Blacktop Jobs Contractors save money with Swen- Swenson Spreader & Mfg. Co. son Spreaders. Write for information. Lindenwood, Illinois

# BROS tip skeet

**EQUIPMENT NEWS FROM A FAMOUS NAME IN ROAD MACHINERY** 

# HERE'S HOW ROLL-O-PACTOR CONTINUES TO REVOLUTIONIZE "BIG JOB" COMPACTION



Patented Bros design equalizes weight distribution over all four wheels an roughest terrain. "Superload" compaction! Roll-O-Pactor" is backed by the entire Bros factory and distributor service organization.

You spread earth in 18" lifts instead of 6" lifts, and use a 50-ton Bros Roll-O-Pactor\* to compact to greater density with fewer passes. You break the slow compaction bottleneck, and rain doesn't keep you off the job as long as it does with other compaction equipment. Government and private job studies have proved beyond question the value of this Roll-O-Pactor\* that others are trying to copy, even under possible patent infringements.

\*Bros Roll-O-Pactor is patented in U.S.A., Canada and Mexico.

#### TWO NEW TAMPER FOOT DESIGNS NOW OFFERED BY BROS

Illustrated at right are the new Bros standard diamond-shaped tamping roller foot and the replaceable "Tamprite" foot. Both of these foot designs are now available on giant Bros "G" Series tamping rollers. Ft. psi range of the "G" series is 260 lbs. to 738 lbs.

Bros cleaner teeth are new, too. They have adjustable and reversible blades which mean that blades last longer and drums stay cleaner because blade contact can be readily adjusted.



Above left is the new Bros diamond-shaped foot with "relief" shank for easier withdrawai from soil. At right is the "Tamprief" foot with removable tip which saves time on replacement and readjustment, and lengthens foot life.

#### "Quickies" for your information

Since you don't want to be caught with "orphan" compaction equipment, remember that Bros is the world's largest manufacturer of pneumatic tire rollers.

Smaller Bros rubber-tire rollers are 7, 9 and 13-ton models.

Only Bros offers the widely tested and approved "Wobble-Wheel" design so popular on our smaller pneumatic tire rollers.

The medium size Bros Tamper model series offer a ft. psi range of 108 lbs. to 315 lbs. Smooth drum rollers, too.

Road Machinery Division, WM. BROS BOILER & MFG. CO.

1195 Tenth Avenue S. E. . Minneapolis 14, Minnesota

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organization and addres	.5.						

Bros	35	and	50-	10

Special Airborne

Roll-O-Pactors\*

Bros 7, 9 and 13-ton

Pneumatic Tire Rollers

Giant weight Bros

☐ Medium weight Bros Series "M" Tamping Rollers

"G" Series Tamping Bros smooth drum

in higher operating speeds at high pressures with friction and heat minimized in the hydraulic system. The new improved pressure relief valve may be incorporated in machines already in the field.

# Disc-Type Hoist Clutch

Osgood-General, P. O. Box 515, Marion, O., has announced that its new Easytouch disc-type servo hoist-clutch, after extensive tests on actual job opera-



Easytouch Disc-Type Servo Hoist Clutch

tions, has successfully demonstrated its worth on the O-G Model 320, 332, 325 and 327 machines. This Osgood-General Easytouch disc-type servo brake-operated hoist actuates the hoist clutch through a brake friction plate, turning with the driver, which contacts the hoist drum. This allows the hoist-clutch to be engaged smoothly and provides positive control of the hoist drums. An optional combination of the disc-type servo hoistclutch and a torque converter on the engine provides a versatile "load handling device." With the hand or foot throttle. it is possible to safely hold a load in mid-air, or "inch" it up or down. The throttle controls the input speed of the converter, matching its output power against the line pull.

#### Aggregate and Material Dryer

A new Model AD-7 "Flash-Flame" aggregate and Material dryer has been announced by Tarrant Manufacturing Co., 2700 Lake Ave., Saratoga Springs, N. Y. A new design feature of this dryer is a manually operated free-running clutch, which enables the operator to run the power source and the fuel and burner without turning the dryer drum. Tests indicate that this feature will not only be a convenience but also will increase the life of all wearing parts. Power to operate the dryer is ordinarily supplied by a 4-cycle, air cooled, throttle governed engine equipped with a high tension magneto and a gear reduction. If preferred the dryer can be equipped with either a 110-220 volt, 60 cycle, single phase, or a 220-240 volt, 60 cycle three phase electric motor. The dryer is equipped with a 5-gal. capacity tank and manually operated fuel pump. Unless otherwise specified Model AD-7 will come equipped with No. 5 burner which

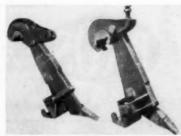


Model AD-7 "Flash-Flame" Dryer

uses slightly less than 5 gal. of kerosene per hour. The dryer is 9 ft. 10 in. long; 4 ft. 3 in. high and 3 ft. 2 in. wide. The loading height is 32 in. The weight is 712 lb.

#### **New Model of Dozer-Rooter**

A completely new model of the Esco dozer-rooter has been announced by Electric Steel Foundry Co., 2141 N.W. 25th Ave., Portland 10, Ore. The new unit is designed for the 40 to 70 HP range of tractors with dozer blade heights of 26 to 37 in. Specifically, the unit is intended for tractors of the D-4 to D-6, HD-5 and TD-9 classification. Model "26" and Model "32," by which the new units are known, weigh 495 lb. as compared with the original units, now



Esco Models "26" and "32" Dozer Rooters

known as Models "38" and "42," which weighed 950 lb. and are designed for horsepower range of 70 to 130 and above with blade heights of 38 to 50 in. The Esco Buck Forte dozer-rooter is a heavy-duty ripping device consisting of a tooth shank housing which mounts on the moldboard of a bull-dozer by means of a special clamp used in combination with adapters and saddles which enable it to fit most popular makes of heavy-duty dozers.

#### Machine Renovates Roadside Slopes

A new machine, designed to both aerate and renovate roadsides, is now being built by Soilaire Industries, 1208 2nd Ave., South, Minneapolis, Minn. Called the Renovataire, this machine has 22 in. renovating wheels built in pairs and individually suspended from the drawbar so as to provide a free floating differential action that will follow any contour, and at speeds up to 5 MPH or more. Transporting is easily handled by a hydraulic lift frame for towing on highways. Saw-toothed knives, adjustable from 2-3-4 in. in depth, penetrate the soil with a slicing action and make 2-in slits. There is no surface disturbance, and a minor amount of soil is extracted with each insertion. It is claimed that for worn out, compacted and eroded roadside slopes, parkways, grass islands or new seeded construction the Renovataire should be of great value in maintaining healthy turf by getting air, moisture and fertilizer down to the root zones.



The Renovataire

### 6½-ft. Tire Now in Production

The B. F. Goodrich Co., Akron, O., has announced the start of production of the largest tires it has ever made — 6½ ft. in diameter and weighing 1,200



# STANDARD STEEL "S-J" for PATCHING - PRIME COAT - SEALING-SHOULDER REPAIR and CRACK FILLING

Standard

# Compare These Special

- T SUCKS BACK surplus material into tank after spraybar is clased. Less drip! Means clean bar for next job!
- ber for next job!

  2 piping and PUMP are automatically drained after finishing motically drained after finishing job! This prevents "freezing or slow start on heavy materials!

  AU OPERATIONS assily com-
- 3 All OPERATIONS easily controlled by one operator riding the unit!
  4 GRAVITY DRAW OFF ON CURB SIDE—means greater safety far operator!
- operator!

  5 ALL PARTS Readily Acressible
  for easy impair. Entire piping
  for easy to be taken down by
  system can be taken down by
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#### OTHER STANDARD STEEL PRODUCTS

Aspholt Pressure Distributors, Tor Ketties, Patch Rollers, Supply Tonks, Toel Haaters, Aspholt Tools, Street Flushers, Censtruction Brooms and Aggregate

# SAVES TIME and LABOR HANDLES ALL TYPES OF BITUMINOUS MATERIAL

\* For year round use—Standard Steel "S-J" Maintenance Distributor can be used either for emergency or secondary construction work.

The most adaptable piece of road equipment you can buy, the "S-J" performs many duties of heavier machines — such as building drives, alleys, playgrounds, parking areas, shoulders, reshaping curves as well as patching and sealing. Quick to start and get going, fast on the job, the low cost of this equipment will be paid for in reduced construction and maintenance cost in a single season. Get the facts and cost on the "S-J" before you invest in any similar equipment.



Standard Steel Works, North KANSAS CITY, MO.

lb. J. E. Gulick; vice president in charge of manufacturing for the company's tire and equipment division, said the new tires are designed to enable modern construction equipment to haul bigger loads faster. He said earth-moving machines using these tires can handle loads as high as 23 tons in such off-the-road operations as turnpike construction, dambuilding and open pit mining. The new tires, size 24.00 by 29, are three times as large and 55 times as heavy as passenger car tires. The largest tire previously manufactured by the company was 24.00 by 25.

#### Improved Windrow and Stockpile Loader

An improved windrow and stockpile loader at lower price has been announced by Athey Products Corporation, 5631 West 65th St., Chicago 38, Ill. This new loader supercedes Athey's Model 3 force-feed loader. The new loader, designated the Model 7-11 forcefeed loader, was developed to give the user a machine matched to his job in one basic model. The basic Model 7-11 can be fitted with two types of moldboard-feeder arrangements that can meet all job conditions. One feeder arrangement includes augers working with a bulldozer type moldboard that can load from either stockpile or windrow with 90 in. width of gather. The other feeder arrangement includes two tapered, grader-type moldboards angling out from



Model 7-11 Force Feed Loader

the front to provide an 84 in. width of gather (12 in. wider than the Model 3) for heavy-duty windrow work where oversize material, such as pieces of sod, ripped blacktop, concrete, or rocks are encountered. This new loader also features a heavy-duty industrial engine, the Ford "215" 6-cylinder 101 HP with a bigger, pressure-sealed cooling system that provides greater dependability and economy. A new heavy-duty two-speed, vacuum-shift rear axle is now standard equipment and is of the wheel-reduc-

tion type. Large 12:00x24 traction tires are also standard equipment. The loader has loading speeds from 0.26 MPH to 1.74 and travel speeds to 20 MPH. The new machine also features simplified hydraulic controls.

# Portable Testing Machine for Job Site Work

A new portable testing machine, announced by Soiltest, Inc., 4520 W. North

### Reduce Labor Cost With-

# SOLAC PAVING COAT



SOLAC is the most easily applied of any gasoline and oil resistant pavement sealer.

SOLAC may be applied to large jobs by an ordinary asphalt distributor.

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— Little or no mixing is necessary. SOLAC is homogeneous. SOLAC is spread easily with a specially designed nylon brush.

Easy as A. B. C.



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# GRACE Asphalt and Compaction Equipment



3 sweeper models, axle, engine or tractor powered.



Chip spreaders 8' to 12' width. Also asphaltic concrete spreaders.



Rapid Fire circulating heaters heat and unload large tanks of asphalt.





Rapidspray Maintenance Distributors.
Also heaters for production melting
of barreled asphalt.



Pneumatic rollers 7 to 50 tons.

W. E. GRACE MFG. CO.

6007 S. Lamar

Dollas, Texas

Ave., Chicago 39, Ill., makes possible rapid on-the-job testing of concrete and similar materials with laboratory accuracy. The 200,000 lb. capacity machine can be used in field and laboratory testing of concrete cylinders and beams and other construction materials. The tester is entirely self-contained and no electrical or pressure connectors are required. The machine is simple to operate. Loads are developed by means of a hand operated, two speed concentric pump which actuates the piston of the main hydraulic system. The unit meets ASTM and AASHO specifications for design and accuracy of hydraulic concrete testing machines.



Portable Testing Machine

#### **Lightweight Diaphragm Pump**

A completely redesigned lightweight diaphragm pump is now being manufactured by Marlow Pumps, Ridgewood, N. J. The new pump is considerably stronger and more compact than the original models first introduced two years ago. Two sizes are available. The smallest, Model 202A, is used with 2-in. hose and handles up to 3,000 gal. per hour. The 3-in. size, Model 302A, removes up to 3,300 gal. of seepage water per hour. Both models are used primarily for muddy or sandy ditch work. Like other Marlow diaphragm pumps, they are self-priming and in spite of the small size operate on suc-



New Lightweight Diaphragm Pump

tion lifts up to 20 ft. They can be used with total liquid heads not exceeding 40 ft. of water. According to the manufacturer, improvements consist of more

performance, more rugged design, more compact design, and easier maintenance.

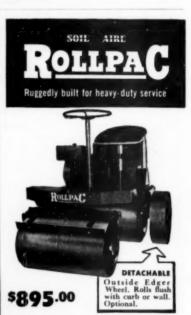
#### Manufacturers' Literature

#### How to Select Fuel for Tractors

A concise booklet, "Fuel-Wise," explaining the comparative advantages of different types of fuel for tractors and power units, has been issued by Minneapolis-Moline Co. By using the booklet's simple calculations, the prospective buyer can determine the engine and fuel best suited to do his work in whatever locality — Minnesota, Mexico, or Madagascar. The booklet can be obtained by writing to: Bon. D. Grussing, Advertising Department, Minneapolis-Moline Co., Box 1050, Minneapolis 1, Minn.

### Items to Consider Before Concrete Pour

A check list of ten important items to consider just before you begin a concrete pour is available from Irvington Form & Tank Corp., 20 Vesey St., New York 7, N.Y. The Atlas concrete checker, as it is called, reminds concrete bosses to make a last minute check on such important items as grade nails, accessories, boxes, sleeves, pilaster chamfer strips, and many other items.



A Standout Popular-Priced One Ton Roller. Send for Catalog.

### SOILAIRE INDUSTRIES

Minneapolis 3, Minnesota

Sold by over 75 distributors in United States and Canada

**Power Hydraulic Controls for Shovel-Cranes** 

A 12-page booklet No. 2424, issued by Link-Belt Speeder Corporation, Cedar Rapids, Ia., describes operating and maintenance advantages of its Speed-O-Matic power hydraulic control system which is said to increase shovel-crane output 25%. This is stated to be based on the faster cycles possible, the reduced operator fatigue, greater accuracy and lessened downtime. Another stated benefit is the elimination of up to 150 working parts in drum clutches and swing clutches alone, providing reduced maintenance and clutch adjustment. Cartoons, diagrams, exploded views and on-the-job photographs illustrate Speed-O-Matic's operating principles and advantages.

Screens for Heavy Duty Service
The new, improved Mesabi vibrating screen, built specifically for severe service applications, is the subject of a 16-page bulletin (No. 651) published by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn. Covered in detail are the structural features and operating characteristics. Screen capacity, size selection and installation are fully covered, and the bulletin is well illustrated with numerous cut-aways to show mechanical details and features of design. The installation drawings, data and specifications, accompanied by text material and tables enabling proper selection of the correct screen for the job, will be helpful to anyone contemplating a new screen application.

Seeder for Highway Contractors

A seeder which is being used extensively by highway contractors is illustrated and described in an 8-page catalog issued by The New Holland Machine Co., New Holland, Pa. The spreader can be controlled entirely from the tractor seat. One lever permits the operator to choose from four apron speeds. The rate control gives 70 possible settings. The spreader is made in three models having overall widths of 9 ft. 6 in. to 13 ft. 6 in. The hoppers have capacities of 8.8 cu. ft., 11 cu. ft., and 13.2 cu. ft. The company also manufactures a forage harvester for spreading straw on shoulders, banks, etc. This was used in the construction of the Pennsylvania Turnpike.



# WHITE VIBRATORS OFFER LOWER OPERATING COSTS

INITIAL PRICE IS LOWER . ALL DRIVE SECTIONS ARE INTERCHANGEABLE . ALL VIBRATOR HEADS ARE IN-TERCHANGEABLE . LENGTH OF DRIVE IS UNLIMITED . ENGINE OR MOTOR POWER UNITS ARE OF STAND ARD MANUFACTURE . MINIMUM OF SPARE PARTS REQUIRED . BACKED BY 20 YEARS OF SUCCESSFUL USE

For FREE circular write -

Elkhart 20, White Mid. Co. Indiana

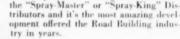


# For me it's LITTLEFORD "SPRAY MASTER" WITH THE NEW MECHANICALLY OPERATED FULL CIRCULATING NO-DRIP SPRAY BAR

Again Littleford has Engineered a product to simplify the spraying of Asphalt, Tar, Emulsion, Road Oil and Cut-Back. The New Mechanically Operated No-Drip Spray Bar. It's the Spray Bar Contractors and Highway Departments have been waiting for. This New Mechanically Operated No-Drip Spray Bar circulates the entire length up to 24 ft. long, under pressure.

By simply pulling a lever all nozzles spray in unison, by pushing the lever nozzles stop spraying instantly. No other valves or gadgets have to be turned on or adjusted.

Spraying can be done with any length of bar, one-half the bar, or any desired width, because each nozzle has its own individual valve. The Mechanically Operated Spray Bar is "Lite-Wate" it weighs one-third less than ordinary bars. It's end folding and one man can easily handle it. Quick acting couplings make the removal or addition of spray bar simple, quick and easy. This new Spray Bar is designed to fit either the "Spray-Master" or "Spray-King" Dis-







# stop air pollution

# with the Liquid Precipitator "Multiple-Action" Scrubber

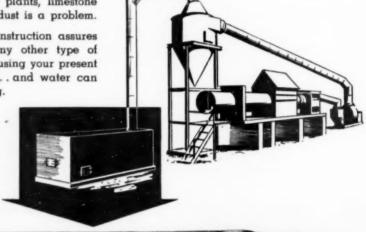
• The "LP" Multiple-Action Scrubber is the most efficient unit yet developed for removing dust from stack discharged gases. Even low and sub-micron dust particles are removed from the stack discharges of asphalt plants, limestone plants and other plants where stack dust is a problem.

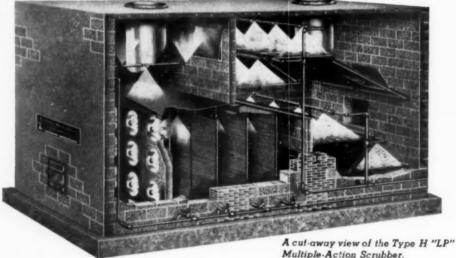
Low-cost cinder block or concrete construction assures longer trouble-free operation than any other type of scrubber. Low back pressure permits using your present fan equipment. Requires less water... and water can be recirculated. No complicated piping.

The "LP" Multiple-Action Scrubber uses six different principles that have proven successful in Johnson-March Dust Control Systems for many industrial applications.

If you have a stack dust problem . . . or if you want to eliminate dust at crushers, conveyors, screens and

dumping and loading points, call in Johnson-March engineers today. Write for detailed information.





# Johnson March

Dust Control Engineering

DEPT. BR, 1724 CHESTNUT STREET, PHILADELPHIA 3, PA.

#### FOR RENT ONLY

TD18 Side Boom

D7 Side Boom

D6 Angle Dozer — Cat 6A Blade D7 Bulldozer — Hydraulic

#### FOR RENT OR SALE

Tri Line Cement Saws (3) Cleveland Trencher Barber Greene - 705A on Rubber (2) Ottawa Hydro Hammer (2) Cat 12 Grader - 9K Series w/Scarifier Buckeye 12 Trencher, D4400 Power

(Rental recapture on above priced right.)

#### FOR SALE

1750 Gal. Water Tank
2-105 CFM Davey Compressors with
Air cooler and receiver tank for
power-Take off or V belt mounting - Perfect condition - each
1-Cleveland Baby Digger - Needs \$200.00 -Cleveland Baby Digger - Needs repair - Cat D4400 Power Plant—300 hrs. - F8 Ford Tractor on air—Good condition - 10:00x20 Rubber—Saddle Tanks—2 Speed,

Consolidated Gas & Service 1819 Le Moyne Ave. Phone 542404, 542405 SYRACUSE 8, N. Y.

#### FOR SALE TO SELL CHEAP

30, 35, 40, 45, 56 & 60 pound Relaying Railroad Rails with Connecting Bars

100 ea. 36 inch gauge Railroad logging Cars, 8 wheels on 4 Axles.

- 15 Ton and 1 - 25 Ton Steam Browning Standard Gauge Locomo-tive Cranes

115 Section — 4½" OD Youngstown, Grade E Drill Pipe with Hughes Connections, 16.6# per foot. 1 — 5 inch Core Barrel, Type J.

TELEPHONE - WIRE - WRITE

### Leon A. Familant **Enterprises**

Suffolk, Virginia

#### FOR SALE

KOEHRING 3/4 yd Shovel, model 304, serial number C-5344. Int. Diesel.

LORAIN 3/4 yard Crane, model L-40, serial number 10115. 40-foot boom. Cat. Diesel.

ALLIS-CHALMERS HD-5B Bulldozer, serial number 1675. GM Diesel. Price \$3,500.

JAEGER Concrete Mixer, type 16S, Rub-ber-tired wheels, used several months. Price \$500.00.

YORK STONE AND SUPPLY CO. Phone: 7357 York, Pa.

#### **Asphalt Plant For Sale**

Cedar Rapids Patchmaster Portable Plant. Used about one season, Excellent condition. Price for quick sale \$3,750.00

Barber-Greene Co. 9 S. Clinton St. — Phone STate 2-5923 CHICAGO 6, ILLINOIS

#### FOR SALE AT NEW LOW PRICES SURPLUS EQUIPMENT FROM TRENTON DAM (NEBRASKA)

1-51-B Bucyrus-Erie 2 yd. Shovel. 1-1600 Manitowoc 20T, rubber tired Wagon

Northwest 25 diesel Dragline.

-International TD-24 Tractors.
-Caterpillar D-8 Tractors.
-Caterpillar 12 Motor Graders.

4—c.aterpular 12 Motor Graders.
6—13 cu. yd. Euclid Bottom Dump Wagons.
3—10 cu. yd. Sterling diesel Dump Trucks.
5—LaPlant-Choate TS300 Motor Scrapers.
2—Le Tourneau Super C Tournadosers.
4—LeTourneau FU Carryall Scrapers.

1—Single Drum Sealing Roller.

1—Woolridge H.D. Ripper.

1—C. S. Johnson 24 cu. yd. Concrete Batch Plant with cement silo and mixer — little

-4 cu. yd. Maxon Dumpcrete. -4000 gal. Mack diesel Water Truck

1-DW10 diesel Tractor.

10—Transformers, 37½ to 100 KVA, 7200/12, 470Y120/240 volt. 1—Gardner-Denver 365 cu. ft. portable diesel Air Compressor.

NEW SPARE PARTS FOR ALL UNITS MANY MISCELLANEOUS ITEMS

Phone, Wire or Write for Catalogue and Specifications

#### VINNELL-UNITED-BELL

P. O. BOX 178

TRENTON, NEBRASKA

PHONE 2151

#### FOR SALE LOW BOY TRAILERS

Drop frame or flat frame any length

Price .... \$2,650.00

PASKO MACHINERY & STEEL CO. 1721 Chicago Drive, S.W.

Grand Rapids, Michigan Phone Ch 10124 - Ask for Mr. Pasko

#### FOR SALE

1-Used Garwood Scraper - Model 511. Excellent condition - Good tires.

Complete Shovel Front attachment for 304 Koehring Dragline. Used about 45 days. Complete and in excellent condition.

**Graves Bros., Contractors** P. O. Box 71 - Phone 6458 Pine Bluff, Arkansas

#### PILE DRIVING EQUIPMENT

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for inspection contact auctioneers; Euclid 27W crawler flatbed wagon; Two Heil TW-16 bottom dump wagons, doors self cleaning; Three Caterpillar No. 80 scrapers, scrapers built up for extra load, good; Three LaPlant-Choate C-314 scrapers, built up for load, good. Five Caterpillar No. 12 motor patrols, 4 8T'S and one 7T, 1 w/scarifier; Cat 66 Pull Blade; Caterpillar 48 power controlled elevating grader, 25 ft. carrier, belt never used; Koehring 34-ELA dual drum paver; Rex 34-E dual drum paver; White F-10 asphalt kettle; Koehring 20x22 longitudinal finishing machine; other concrete equip.; Seven Ford F-6 dump trucks, V-8 engines, 2 speed axles, syncromesh trans, heavy springs, beds 6x8, good trucks; other trucks, trailers and jeeps, cable control units; Six sheepsfoot rollers; LeT rooter; Fleco stumper; 8 compressors from shop compressors up to Joy 500 air compressors; pneumatic tools; light plants; welders; welding equipment pumps; portable frame buildings and many other miscellaneous items too numerous to mention. This is a large sale of many different types of equipment and it is all owned by one firm. Most of the major pieces are late model and are ready to be put to work for you.

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All in good condition reasonably briced.

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1 — Oliver Lull tractor loader, Industrial 86; serial 920157; Lull loader B259; model 4B; capacity 4000±, 1400 x 24 rear tires — good; 700 x 20 front tires — good; 6-speed forward, 2-speed reverse \$1,750.00

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or dealers wanted to sell concrete saw blades direct to road builders and general contracto to builders and general contractors. Tremendous repeat sales make this a most lucrative line if you have close contacts with road-building contractors. Several territories throughout U.S. still open. Send us complete personal data. All replies confi-

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ADT Rotary Dryer, 5' diameter, 37' long. Will alter to suit requirements and also de-liver. Price \$3,000.00

Box 395

ROCHESTER, N.Y.

Culver 5369

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Barber-Greene Model 840 Asphalt Plant complete with Model 839 Drier, model 864 Gradation Unit, Power, running gear and all piping and fittings.

This plant has only run 35,000 tons, gradation unit 20,000 tons. Entire plant completely overhauled this spring and is in top condition. Plant new in 1952 and gradation unit added new last year.

65 H.P. steam generator in excellent condition, also available if wanted.

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Cedar Rapids, Iowa

#### FOR SALE

1-New "Quick-Way" Model E shovel front \$1,100,00.

- 1-Dearborn Grader Attachment for Ford Tractor, like new.
- 1-Huber maintainer with front end loader 1-Allis-Chalmers WC grader with front end
- 1-Adams No. 84 leaning wheel grader on
- 1-Caterpillar No. 66 grader.
- I—Galion No. 178 pull grader on rubber. I—IHC TA-40 crawler tractor.
- 2-Root Spring F-33 scrapers.

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Dixie Highway Hoopeston, III.

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New '51 Keystone Combination Blast hole outfit (slightly used) with tools. Now mounted on five-ton autocar truck. \$6,500 in Mass.

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Road grading firm in N. Dak.-Minnesota area who would like working partner with \$50,000.00 in capitol and equipment. Seven years experience on all projects.

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# FOR

5-Current Model C Tournapulls in top condition. These were new in 1952 and have new 2000 RPM Cummins motors complete with compressors. Two rigs have new stators. Two have new rotors. They

all have new transmissions. The rubber is very good. 2—Allis-Chalmers TS200 Motor Scrap-ers complete with new transmissions, new hydraulic pumps, and overhauled motors. These were new in 1952. They are in top shape with very good rubber.

D8 Dozer complete with Model 25 P.C.U. and 8S Dozer. Excellent con-dition, 2U series, 16000 serial.

TD24 Push Cat complete with all factory changes up to date. Motor has had major overhaul within the last 500 hours.

TD24 with Model 25 P.C.U. and 8S Dozer. Late model. Completely cur-rent and in top condition.

TD24 with Superior Side Boom. Both tractor and side boom practically new w/less than 700 hours opera-

This equipment is all in top condition and is currently working on a contract where it can be inspected. It will be available very shortly and we prefer to move it as a complete spread. However, we will give some consideration to selling the separate units.

For Further Information, Call or Write:

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#### WANTED:-

D6 Side boom attachment 5R Series 6

T9 Traxson swing crane or attachments

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8" and 12" Line Pipe 130,000' 8%" OD 28.55# Lapweld 40,000' 1234" OD 49.56# Lapweld

All #2B Grade, machine cleaned, straight, 20' single random lengths, ends beveled. Suitable for oil well surface casing, water well casing, low pressure pipe line service, structural columns or piling. Priced low for prompt shipment from Grandview, Mo. and Welda, Kans.

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126,672 feet — 81½" O.D. 28.55 pounds per feet 36,325 feet — 123½" O.D. 49.56 pounds per foot

The above reconditioned steel pipe is machine cleaned, straight, beveled for welding in 20 feet random lengths.

	BLECTRIC WILD	PIPE
Outside	Wall	Quantity
Diameter	Thickness	In Feet
8%"	.352"	1000
91/4"	.385"	4200
16"	.375"	4800
20"	.281"	2400
24"	.406"	1600
26"	.312"	4200
30"	.375"	1200

This is structural grade pipe in 40 foot lengths.
All pipe is suitable for gas, water and oil as well as for culverts, piling and structural FOR SPECIAL QUANTITY PRICES WRITE, WIRE OR PHONE

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1600 hp F-M diesel 38-D-8½. Dredge pump
20" suction, 18" discharge.

Jaw crushers up to 48 x 60 — gyratories —
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ball mills — hammer mills — screening,
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#### **Bottom Dump Tractor-Wagon Combinations**

On Sale for Approximately 33c on the Dollar

Used Euclid Model FDT Bottom Dump Tractor-Wagon Combinations, 13 Cubic Yards Struck and 19 Cubic Yards Heaped. Powered by General Motors Model 6-71 Diesel Engines, Two Stroke Cycle, Six Cylinder, 41/2" Bore, 5" Stroke, 425 Cu. In. Displacement, 190 Brake H.P. at 1800 R.P.M.; Fuller Model 5F1220 Transmission; Lipe Single Plate Non-Adjustable Spring Loaded Clutch; Air Brakes; Heavy Duty Front Axle and all mounted on 12:00 x 24 fourteen ply tires front; 21:00 x 25 twenty ply tires tractor drive and trailer.

NEW PRICE .....\$24,690.00 Ea. OUR PRICE — F.O.B. OUR YARD...... \$ 8,500.00 Eq.

The machines are available to you for sale, lease or rental. For further information write — wire or phone.

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2-Model 34E Ransome Dual Drum Pavers powered by Cummins Diesel Engines. \$4,000.00 each, FOB Long Beach, Calif.

SEND FOR OUR COMPLETE EQUIPMENT BULLETIN

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Highest dollar value paid for new and used trucks and all kinds of used equipment. All types of truck equipment bought and sold, including war surplus. Write, phone or wire:

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With Option to Purchase Rebuilt - Al Condition

- 1 13½ cy Letourneau Scraper 1 48B Bucyrus Erie Shovel 2 cy diesel
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- Caterpillar D8 Bulldozer
- Shovel Front for Model 6 N.W.
- 1 Shovel Front for Model 25 N.W. WILLIAMS CONSTRUCTION COMPANY

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ALLIS-CHALMERS model HD-20G tractor loader with 4 cu. yd. bucket. Only 16 months old - GM6-110 engine, clutch torque converter and hydraulic system completely overhauled. Heavy duty rollers, tracks, and balance of machine all in first-class condition. Entire unit is A-1 throughout.

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No. 51 Link Belt Speeder, ½ yd. shovel. 1951. \$10.000.

D-8 Cat tractor & bulldozer, 1H2279, 1946. \$4,950.

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No. 12 Cat motor patrol. 9K2180. 1946. \$6.875.

Double-drum sheepsfoot roller, 1947, \$750. Rosco 8' power broom. 1951. \$750, Rapid paving breaker, model H. 1946. \$1,875.

Jaeger 'H' concrete finisher, 20'-24". 1945. 10 ton Austin-Western 3 wheel roller, R19, 1930, \$1,500.

Galion 202 motor patrol, 12N81, 1951, \$5,400, LeTourneau dirt scraper, 14 yd. 1945, \$2,950.

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#### FOR SALE **DRAG BOOMS and BUCKETS**

50 foot boom, 2½" tubing for ½" lattice bracing with point sheaves—Will fit P&H 255.

5-Yard Bucyrus-Erie rock dipper with door and bail for 120-B.

½-yard coal bucket with door and bail for Marion 361 or 372.

90 foot crane or dragline boom—lattice cord angle  $3\frac{1}{2}$ " x 5" x  $\frac{3}{6}$ " lattice bracing —  $1\frac{3}{4}$ " pipe tubing with point sheaves.

70 foot dragline boom with fair leads for Bucyrus-Erie 43-B or 44-B.

Complete front end dragline equipment for 120-B Bucyrus-Eric shovel. 90 foot lattice type boom. All necessary hoist machinery for conversion with suspension cables and one 4-yard ax bucket.

Single and double flanged rollers for D-8 tractors — New and unused \$85.00 each; used \$20.00 to \$50.00 each.

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Lorain Model 80 shovel and/or dragline Caterpillar diesel engine - completely re-built and priced to sell.

Northwest Model 25 shovel - late model. diesel power.

Lorain TL-25 shovel and backhoe, Cat diesel, used slightly.

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2-Caterpillar DW-21 tractor-scrapers-1 yr.

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Chain Belt Model 200 pumperete, rebuilt and guaranteed for 1 year.
Parsons Model 221 and 250 trenchers in ex-

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60"x60" double drum sheepsfoot rollers -nearly new. Capterpillar #12 motor grader — used slightly and priced right.

2—Euclid Model 49FD rear dump trucks in excellent condition.

LaCrosse 25-30 ton lowboy trailer

2—8 yard scrapers — one cable and 1 hydraulic — Cheap buys.

We have extensive listings of all types of used contractor's equipment and solicit your inequiries for your needs. We shall quote on good buys in excellent condition upon request.

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Dealer in Used Contractor's Equipment Office 3-6456—P. O. Box 263—Night 5668 ASHEVILLE, N. C.

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34E Multifoote Paver Adnum Blacktop Payer

Crane (Steam Locomotive No. 2) Orton & Steinbrenner Co., Mfg., Chicago,

108-2 McKiernan Rebuilt Pile Hammer 16EL4P4 Jaeger Concrete Mixer, 1947 145 Concrete Mixer, (Jaeger) No. 14

Hoist, Clyde - 2 Drum - 55HP - 6 Cylinder

Cedar Rapids Junior Tandem Rock Cr. Plant, 1036 Jaw Crusher

3 Mississippi Wagons, Model 75-5, 72

**Butler Model GA-7-23 Gasoline Engine** Operated Carscoop, 10 Cu. Ft. bas-

Trench Hoe Attachment for Model No. 303 dragline - New

30" by 40" Conveyor Hopper with Grizzley, pneumatic Tires, Vibrating Screen and power

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#### FOR SALE CEDARAPIDS JR. PORTABLE WASHING PLANT

This plant has revolving screen with sand jacket and scrubber, a sand drag tank mounted on top of an all steel bin which can be divided into two, three or four compartments according to the sizes of washed material desired. Plant will average 35-50 cu, yds. of finished sand and aggregate per hour.

**SPECIFICATIONS** 

36" x 13' revolving screen—54" x 8' sand jacket—36" x 4' scrubber—60 ton 8' x 18', 4-compartment bin—30 H.P. required—24" x 90' feed conveyor—36" and 48"—36" sand drag tank—Caterpillar Diesel 8800 elec. set. 6" Barnes elec. pump-powered by electric motors. Plant was completely rebuilt last fall-Price

Brown, Inc.

R. R. 2

Phone 2-4477

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1946 Dryer — 66 in. x 24 ft. 0 in. — Capacity, 50 tons per hour — complete with frame motor — gear belt drive and burner-combustion chamber and chute. All in good condition — located at foot of Westchester Ave., Port Chester, N.Y. \$3000.00 where is and as is!! Tel. POrt Chester 5-0509 or WHite Plains 9-0540.

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7-25,000 gallon welded construction horizontal steel tanks, \( \frac{5}{a}'' \) shell, \( 10'6'' \) diameter, \( 40'6'' \) long, \( designed \) for 50 psi. \( Price F.O.B. \) Cars, \( Georgia \) \( \frac{3}{41,250.00} \)

HENRY M. MOORE
Phone 23664 - P. O. Box 1072
ROANOKE, VIRGINIA

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I—Rex two Bay Concrete Mixer, Model 1951, Condition Excellent.
 I—TD-18 International Tractor with cable, blade and Wooldridge 8 to 10 yd. scraper.

W. T. KERN — Attorney for Trustee Hamilton Nat'l Bank Bldg.—Phone 5-0238 KNOXVILLE, TENNESSEE

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Will clear from 5 to 8 acres per day. Cuts off trees from one to three inches under ground leaving no stumps. Less disturbance of top soil. Land ready for immediate use. Cuts trees up to 5 and 6 feet in diameter. Will also uproot trees same as dozer where necessary. Operating in 12 states where it has been introduced. Have been used for clearing problems for Levees, Pipe Lines, Right-of-Ways, Reservoirs, Lakes, Strip Mines, Cultivation and many other operations. Tests prove that it costs much less to clear with this Blade than by any other clearing method on the market today. Patented Sept. 1st, 1953. No. 2,650,628. Patent applied for Aug. 14, 1952.

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Each tooth is made of a solid piece of 21/2" steel. Will withstand rugged

This rake is a solid unit with the solid teeth an integral part. This rake can "take it".

The teeth are set so that they can be easily run at the desired level without "digging in".

This rake is designed to move large quantities of trees and brush. Will compact larger quantities into smaller areas.

These compacted piles can be easily burned.

A strong, sturdy rake that surpasses any on the market for piling brush, trees, stumps and roots. This rake was designed to meet the requirements of land clearing companies. THIS RAKE IS RAPIDLY REPLACING OTHER TYPES OF RAKES.

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HA Hough payloader (excellent condition)	2,100.00
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condition)	5,000.00
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TD-18 With LeTourneau winch (good condition)	6,000.00
TD-24 With Bucyrus-Erie cable bulldozer (excellent condition)	16,000.00
A number of good used Bucyrus-Erie P-24 and P-25 winches \$550 to	\$750.00
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I ERIE STRAYER portable 1-yd. concrete plant complete with lift ramps, bucket elevator, bins, etc. Rated capacity 80-yds, per hour. Two years old, excellent condi-tion, looks like new. Original cost approx. \$25,000. Reduced for quick sale, \$14,500. 4 late model Studebaker trucks with special dump-crete bodies to work with above plant, excellent condition, look like new. Reduced for quick sale, \$1450 each. All above equipment located at our yard.

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  The above equipment is in excellent condition and priced to sell.

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OSGOOD 1/2 Yd. Shovel with G.M.Diesel.

POWER GRADER, AMERI-CAN, with 10 ft. Moldboard, Scarifier, Cab.

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- -2 Cu. Yd. Page dragline.
- Sets D7 and D8 rails and pads with new pins and bushings.
- 6-D8 Belly pans.
- 2-New Truck tracks for Athey wag-
- 1-D4 cable hilift with new fan belts. 10-ox6 International Trucks, Anthony body and hoist.
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- 2-11/2 K.W. Kohler Light Plants. 2-5 K.W. Kohler Light Plants.
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- Cat 13000 engine, just overhauled.

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TS-300 Meter Scrapers. Good to excellent.

75-300 Meter Strapers Strapers
\$8500 ea.

D-7 Brand New, Ser. No. 3721748 with Cat. No.
25 Unit. Belly Guard & Pull Hook. 10% off
res. price. Terms.

TD-24 Dearer. Ser. No. TDE-3844 — 2045. New
1959. DDPC Units. Formerly owned and well
maintained and modified by TVA. 38000.

LaPlante Cheate C-84 15-yd. scraper. A-1. Tires
like new. \$3250. Rental-purchase.
New McCaffrey Clamshell Buckets. To introduce
will rent at low monthly rate with purchase
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Duffor Elevating Grader for Cat. No. 12. Like

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Arrow Mfg. Co. 29-ton Low-Boy. Factory new.
All brakes. Lights. Extended gooseneck. 8-25
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Lorain L-41 % cu. yd. heavy duty shovel No.
17632. 1948. Cat. Diesel No. 318. 637 hours.

Good. \$7500. Rent \$600 monthly apply purchase

Insley Carrier Mounted Crane, Dragline & Back-

Insiey Carrier Mounted Crane, Dragline & Backhoe. Demonstrator. New April. Guaranteed like
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Ready Mixed Plant. Batching bin 60-80 ton.
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Orig. cost over \$60,000. Consider rental-purchase.

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Simplicity Vibr. Screen 4' x 12'. 3-deck with ball tray. Brand New. \$3350. Orig. cost \$4500

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- I-TD-18 International with Bucyrus Erie hyd, bullgrader \$7,550.00
- hyd, bullgrader

  TD-14 International standard gauge with acyrus-Erie hyd, bullgrader

  \$6,450,00

All Machines in Good, Sound Condition

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- 1-Gradall Model 2400 mounted on International Truck
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I.D. SIZE	10 FT. LENGTHS COUPLED	20 FT. LENGTHS COUPLED	25 FT. LENGTHS COUPLED	50 FT. LENGTHS COUPLED
11/2"	\$ 8.50 \$14.50 \$32.50	\$15.00	\$17.00	\$28.50
21/2"	\$14.50	\$26.50	\$32.00	
4"	\$32.50		\$75.00	

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WATER SUPPLY AND DISCHARGE HOSE IN 2 TYPES OF CONSTRUCTION SINGLE JACKET COTTON RUBBER LINED HOSE

I.D. SIZE																			P	E	_		OU		-		IG1	H	1	-	PE	R	-	-			ED	-	ST
11/2"																							\$11	1.2	15							-		\$1	18	.5	0		
21/2"																							\$15	5.0	00									\$2	28	.5	0		
3"																							\$24											\$4	12	.5	0		
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ANY THREAD COUPLINGS CAN BE ATTACHED TO HOSE LISTED. PLEASE SPECIFY THREAD DESIRED. WE SOLICIT INQUIRIES FOR ANY KIND OF HOSE.

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RATIO HORSEPOWER STYLE STOCK NO. MFG. FARREL-BIRM. Parallel 1499-114RD 14.9-1 500hp FARREL-BIRM. 500hp Parallel 1459RD 21/2-1 1499-117RD Falk Corp. 300hp Parallel HORS.-SCOTT HORS.-SCOTT 288hp 3.6E-1 Parallel 1499-71RD Parallel 1499-112RD 32 - 1125hp HORS.-SCOTT 88.2hp Parallel 1499-113RD 9 - 150hp DeLAVAL 11-2/3-1 Right angle 1399-182RD PALMER-BEE 8-1 50hp Vertical 1399-168RD Right angle Right angle 29½-1 39-1 LINK BELT CLEVELAND 34.5hp 1247RD 1399-236RD 33hp CLEVELAND 20hp Parallel 1087RD 282-1 17hp Right angle HORS.-SCOTT 45 - 11315RD 1399-114RD FOOTE BROS Right angle 33-1 15hp

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I-Model 44-C Barber-Greene Trencher.

I-Worthington 210 Compressor—on 4 Pneumatic
Tires.

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#### Manufacturers' Literature

(Continued from page 119)

#### Bedrock Determination by Seismic Method

An illustrated booklet entitled "Bedrock Determination by the Seismic Method" is available from Southwestern Industrial Electronics Co., P.O. Box 13058, Houston 19, Tex. The booklet describes the equipment, the basic theory of the method, and gives the solution of a representative bedrock determination.

#### **New Airco Heliweld Catalog**

A new 16-page catalog (ADC 709B) is offered by Air Reduction Sales Co., 60 East 42nd St., New York 17, N.Y., covering in detail features of the Heliwelding process and the equipment used with it. The catalog fully describes and illustrates in actual welding operation, the manual holders either air or water-cooled, light or heavy duty water cooled machine holders for use with the semi-automatic equipment and the automatic head that can be used with the Heliweld process.

#### **Truck Cranes**

A new 28-page booklet (TX-143) on P&H truck cranes is available from Harnischfeger Corporation, Small Excavator Division, 4602 W. National Ave., Milwaukee 46, Wis. Devoted to the P&H Models 255-A, 355-A and 555-A, the two-color bulletin gives a broad picture story on these machines. In addition to dozens of large-size on-the-job pictures, are complete descriptions and specifications of important features such as carriers, power plants, P&H torsion bar front axles, and convertability. The live roller circle of P&H design is illustrated with large, close-up pictures. The ma-chinery decks of each model are pictured in detail and P&H's direct-acting hydraulic control is explained concisely. A very interesting feature of the book is the "motion picture" story on the takedown of P&H's boom for road travel.

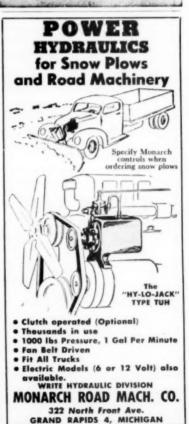
# Tractor Attachment for Grubbing Trees

A folder illustrating and describing its tree grubber has been issued by The Continental Manufacturing Co., Box 983, Kilgore, Tex. The grubber will operate on any tractor with a 3-point implement hitch. It combines the horizontal power of the tractor with the vertical force of the hydraulic lift. Trees up to 6 in in diameter are pushed out of the ground at about a 45-degree angle. The grubber removes the roots along with the trees.

#### **Dual Purpose Blast Hole Drill**

A new bulletin (Form 4153) describing the new QM-2 Quarrymaster, a dual





purpose blast hole drill for either rotary or percussion drilling is available from Ingersol-Rand Co., 11 Broadway, New York 4, N.Y. The bulletin tells the story of the "M-2 as a percussion drill pointing-up its features and its uses. Two additional pages do the same thing for the unit as a rotary drill. The center spread, by means of a large illustration and easily read captions, depicts the individual features that make-up the Quarrymaster. Other pages of the bulletins show "inuse" pictures, give dimensions and specifications and list accessories that are available.

#### **New Sierra Loader Models**

A new 4-page, two color booklet describing the new Models C-27 and C-30 Sierra Loaders is available from C & D Manufacturing Co., Perkins, Calif. Job photos illustrate typical applications of the Caterpillar-powered high capacity loaders, highlighting such features as one-man operation, blending of bank materials as loaded, and other cost-cutting advantages on airport, canal, dam, highway and similar earthmoving projects.

#### Seventy-Three I-H Industrial Power Products Described

The complete line of International Industrial power products, 73 in all, is described in a new 48-page catalog published by the International Harvester Co. Technical data has been streamlined, yet provides abundant descriptive material on each piece of equipment in the entire line. First of the eight sections in the catalog describes the seven International crawler tractors, ranging in size and power from the 41,690 lb., 155 drawbar horsepower TD-24 diesel to the 7,155 lb., 32.92 drawbar horsepower T-6 gasoline-powered crawler tractor. This is followed by descriptive information on the International 2T-75 and 2T-55 rubber-tired tractors with scrapers and the 2S-75 bottom dump wagon.

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Two push-loaded and two self-loaded four-wheeled scrapers are pictured and described in the third section of the catalog while the fourth section is devoted to 22 hydraulic and cable-controlled bulldozers, bullgraders and angle bulldozers in the new International line. Allied equipment or attachments to International crawler tractors, such as Drott skid-shovels and Superior side-booms are featured in the fifth section and cable control units and International wheel tractors for industrial use are presented on the pages forming the next two sections of the catalog. Final portion covers the 18 models of International diesel, gasoline and gas power units. The catalog may be obtained by writing to Consumer Relations Department, International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

#### Data Sheets for Diesel Engine Maintenance

A series of three 8% x 11 in. engineering data sheets for industrial users concerned with diesel engine maintenance is available from Wall Colmonoy Corporation, 19345 John R Street, Detroit 3, Mich. These sheets give information pertaining to the application of Colmonoy nickel-base and iron-base hard-facing and spraywelding alloys to diesel engine valves to provide wear surfaces that resist abrasion, impact, galling and corrosion. Typical diesel valve applications

are described in detail including procedures, part sketches, equipment requirements and results.

#### **Gasoline-Driven Compactors**

The new, improved Wayer impactor is pictured and described in a 6-page circular issued by Wayer Impactor, Inc., 175 Hosack St., Columbus 7, O. This is a self-contained, one-man operated machine, designed for tamping highway repairs, patching pavements and tamping earth. It is powered by a 2% HP Wisconsin Model ABN air cooled engine. The finishing plate is cold rolled steel 25 in. x 8 in. x % in. thick, with a 25 in. x 2% in. tamping area heated by engine exhaust. The working speed is 22 ft. to 30 ft. per minute. The machine delivers 1900 blows per minute, each of 1250 lb. impact.

# Manual on Hydraulic Sprocket Pullers

A new sprocket puller manual No. SP-54, available from Owatonna Tool Co., 417 No. Cedar St., Owatonna, Minn., describes and illustrates portable, hydraulic sprocket puller and installing sets in both 50 and 100 ton capacities. These tools are operated and powered with the OTC remote control, centerhole Power-Trim rams which are utilized for other pulling operations as well.



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#### With the Manufacturers and Distributors

LESCHEN MOVES ST. LOUIS OFFICES. The St. Louis headquarters of Leschen Wire Rope Division, H. K. Porter Co., Inc., has moved to its new general office at 2727 Hamilton Ave. The new location is on the present company property, just around the corner from the old.

Beasley-Holmes Co., 2623 Dorr St., Toledo, O., has been appointed distributor for the construction equipment of Worthington Corporation, Harrison, N.J. West Coast Engine and Equipment Co., 1077 Eastshore Highway, Berkeley, Calif., also has been appointed distributor for the construction equipment.

RUSSELL FLEMING has been appointed manager of the Parts and Service Department of The Flexible Road Joint Machine Co., Warren, O.

EQUIPMENT, Inc., Jackson, Miss., has been appointed a dealer for Buckeye ditchers, spreaders and fine graders of Findlay Division, Gar Wood Industries, Wayne, Mich.

EMORY M. HEUSTON, associated with the advertising department of Bucyrus-Erie Co., South Milwaukee, Wis., for 25 years, during the past 9 years as manager, has joined the Richard T. Brandt, Inc., advertising agency of Cleveland, O.

ROADWAY MOUNTING AND EQUIPMENT Co., 21177 Mound Road, Van Dyke, Mich., has been appointed a distributor for truck bodies and hoists of The Heil Co., Milwaukee, Wis.

GLEDHILL ROAD MACHINERY Co., Galion, O., has purchased exclusive manufacturing and sales rights to the Elliotte vacuum leaf loader, formerly manufactured at Troy, N.Y. The loader will be added to the Gledhill line of light road working machinery.

HOMER G. ABBOTT, a member of the production staff of Standard Steel Works, North Kansas City, Mo., for the past eighteen years, has been elected vice-president in charge of production.

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SO TOUGH A WORKMAN DOESN'T WEAR IT OUT!

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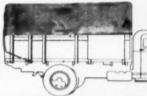
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